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N/D

RESPONSE TO ENCLOSURE 1, U.S. EPA COMMENTS ON THE DRAFT BASELINE RISK ASSESSMENT FOR THE AMERICAN CHEMICAL SERVICE, INC., NATIONAL PRIORITIES LIST SUPERFUND SITE IN GRIFFITH, INDIANA

General Comments

1. **Comment:**

U.S. EPA requested that a matrix of parameter inputs be submitted for EPA review prior to the preparation of any risk assessment. This was not done. Contaminant concentration values (means, UCLs on means, are not reported, nor are the values used in the risk assessment. Hot spot areas appear to have been eliminated by averaging and groundwater inputs appear to be based on averaging across the aquifer. Guidance documents were not used in the derivation of exposure parameter values and methodology, and often references, are not provided for derived values. In some cases, standard risk assessment values are simply changed, with no explanation or site-specific data.

Response:

Details regarding issues raised in this comment are provided in the responses to specific comments below. Generally, however, the ACS Technical Committee ("the Committee") responds as follows:

- At EPA's request, the Committee did submit to EPA for expedited review a summary of all toxicity criteria and physical/chemical input parameters (submitted to EPA on July 31, 1997), the approach for calculating exposure point concentrations, including a discussion of the fate and transport models to be used (submitted to EPA on July 21, 1997), the conceptual site model (initially submitted to EPA on June 5, and a revised version submitted to EPA August 22, 1997), and the existing database for the site (submitted to EPA on July 3, 1997). In addition to these submittals, the Committee also agreed to provide EPA with a matrix of exposure parameter inputs for review prior to completing the draft baseline risk assessment (BRA). It was then agreed with EPA that this matrix would not be prepared and submitted to EPA until there was an agreement on the conceptual site model (CSM). As indicated above, ENVIRON submitted a draft CSM to EPA on June 5, 1997. EPA and the Committee then agreed that a site visit would be required prior to finalizing the CSM; this site visit took place on

August 11, 1997. A revised CSM based on the site visit and initial comments from EPA was submitted to EPA on August 22, 1997, EPA's written comments on the August version of the CSM were received by the Committee on October 1, 1997. EPA's deadline for submittal of the complete preliminary draft BRA was October 29, 1997. Given the limited time available to complete the draft BRA after receiving EPA's final comments on the CSM, it was not possible to prepare the exposure parameter matrix, have it reviewed separately by EPA, and incorporate any EPA comments into the BRA prior to this October 29 submittal date. Thus, the exposure parameter inputs were simply included for review in the preliminary draft BRA submitted to EPA on October 29, 1997.

- The constituent concentration values used in the BRA are provided in the October 1997 preliminary draft (see Tables 3-2 through 3-4, and the tables in Attachment 1 of Appendix C). As agreed with EPA, the values used in each area of the site were based on the maximum reported concentration, or the upper confidence limit (UCL) on the mean concentration, whichever was lower. This approach is consistent with EPA guidance. However, as discussed in response to specific comments below, the BRA will be expanded to provide a more complete presentation of the site data, and address the heterogeneity of the sample results.

- As discussed throughout the preliminary draft BRA report, EPA guidance documents were used in deriving exposure parameter values and methodology. With a few exceptions, references are provided in the preliminary draft BRA for each exposure parameter value taken directly from EPA guidance or the scientific literature, and the general approaches used to calculate derived values are described when necessary. Where references are missing in the preliminary draft BRA, they will be incorporated in finalizing the report. Furthermore, as discussed in response to specific comments below, the derivation of exposure parameter values and methodology will be described in greater detail in the next version of the BRA.

Responses to specific comments are provided below.

2. **Comment:**

The revised draft risk assessment is based on the old database. The revised assessment must be updated using the newly-generated sampling results, as well as the previous results.

Response:

At the specific request of EPA, the Committee prepared the October 1997 preliminary draft BRA using only those data available through September 1997. EPA and the Committee had agreed to conduct additional sampling at the site in September 1997, recognizing that the data from this sampling effort would not be available for the October 1997 submittal, but would be added to the database for use in a second draft of the BRA

report. It was agreed by EPA and the Committee that this second draft of the BRA, based on the updated database, would be submitted to EPA in November 1997, after the data from the September 1997 sampling became available. The data collected by the Committee was provided to ENVIRON in early November and was incorporated in a second draft Assessment. However, the data collected by EPA in September 1997 was not provided to the Committee for incorporation into the database until December 1997. At that time, EPA requested that the second draft of the BRA not be completed by the Committee until after EPA's final comments on the October 1997 preliminary draft had been received. These final comments were received by the Committee on February 10, 1998.

As previously agreed, the revised BRA will be based on the updated database, including samples collected in September 1997. This updated database will also be provided to EPA.

Specific Comments:

3. **Comment: Cover Page:**

   Add the text "revised" to the title baseline risk assessment.

   Response:

   Agreed.

4. **Comment: Section 1.0; Introduction, Page 1-1, first sentence:**

   Add "revised" to the text when referring to the baseline risk assessment.

   Response:

   Agreed.

5. **Comment: Section 1.0; Introduction, page 1-1, first paragraph:**

   Add the following to the text: The baseline risk assessment is conducted both to confirm the need for remedial action at the site. That is, if no action is taken, will the site pose a threat to current or future site "users"?. Furthermore, the risk assessment is used to provide the basis for the development of protective cleanup goals should the remedial action be deemed necessary. Land use is an important consideration in the development of the baseline risk assessment. In addition, the land uses at a site are determined by the remedy selection decision.

Response:

The paragraph will be added, with the following minor modifications:

- The first sentence will be revised to read "The baseline risk assessment is conducted in part to determine the need for remedial action at a site."
- The third sentence will be revised to read "Furthermore, the risk assessment can be used to provide a basis for development of protective cleanup goals should remedial action be deemed necessary."
- The last sentence will be revised to read "In addition, the land uses at a site can be determined by the remedy selection decision."

6. **Comment: Section 1.0; Introduction, Page 1-1, third paragraph:**

Add the following text to the beginning of the paragraph. "Although the BRA was conducted during the Remedial Investigation/Feasibility Study, EPA believes that it is reasonable to revise it due to several factors."

Response:

Agreed.

7. **Comment: Section 1.0; Introduction, Page 1-1, third paragraph:**

After the sentence starting with "[in the six years since, . . .", add the following in additional, it is reasonable future land use for the Site, is that is will remain industrial, in contrast to the conservative assumption made in the original BRA that a resident may reside on the Site in the future.

Response:

The following paragraph will be added: "In addition, it is reasonable to assume that future land use at the site will remain industrial, in contrast to the conservative assumption made in the original BRA that residential development may occur on the Site in the future."

8. **Comment: Section 2.1; Data Evaluation, Page 2-3, Infrequently Detected Contaminants:**

Contaminants found in 5% or fewer samples are not to be automatically excluded. This decision requires the agreement of the site project manager, and is dependent on the contaminant toxicity, concentration and location. The presence of "hot spots" should always be evaluated before eliminating or averaging contaminants across a site area. This information has not been adequately documented.

A list of contaminants considered in the risk assessment and the reason for eliminating the contaminant must always be reported in the risk assessment. EPA did not have the benefit of review of this information in the draft BRA.

Response:

At EPA's request, a list of all constituents proposed to be eliminated from the BRA, along with the reasons for eliminating the specific constituents, will be provided to EPA prior to completing the next draft of the BRA.

9. Comment: Section 2.2 and Tables 2.1/2.2/2.3/2.4; Summary of Constituents:

a) Minimum/Maximum Detection Limits

It was not clear why the minimum and maximum detection limits for non-detects are reported, and how these values were used in the determination of the mean and 95th UCL of the mean contaminant concentrations. It would appear that the contaminant data for the non-detects was not useful when the detection limits were so high, yet no discussion was provided which indicated problems with the calculations. The data used in this BRA must be clearly identified.

It is not clear whether special techniques were used to collect soil samples for VOC analysis, so that the volatile contaminants were not lose in the process. Some of the VOC levels in subsurface soil are extremely low, even though this is a predominantly VOC site. The sampling methods, e.g., were VOC samples collected from open pits or using closed boring, need to be further evaluated and reported. It is not clear what is reported in these Tables, or how the data was used.

Response:

As discussed in the preliminary draft BRA, Tables 2-1 through 2-4 contain a summary of the data on constituents detected in different environmental media in different areas of the site. At EPA's request, these tables will be modified to include the mean, 95th UCL on the mean, maximum, and minimum detected concentrations for each constituent. The maximum and minimum detection limit information will be deleted from the tables. A paragraph describing the procedure used to calculate the 95th UCL on the mean concentration will also be added to the text.

The soil samples used in the preliminary draft BRA were collected under approved EPA workplans, using accepted EPA protocols under EPA oversight. Analysis for volatile organic compounds (VOCs) was performed only for uncomposited samples. Only a small fraction, if any, of the soil samples from each area were collected from test pits. Samples collected from open test pits will be identified in the database.

b) **Site Contaminant Lists**

The lists of the Site contaminants showing the mean concentrations, the 95th UCLs on the means, and the values used in the BRA for each contaminant in each area are not included in the draft assessment. This data is essential to the risk assessment and must be included.

Response:

See response to 9a. The values used in the BRA for each constituent in each area were presented in the draft BRA; see Tables 3-2 through 3-4 and the tables in Attachment 1 to Appendix C. They will also be included in the revised second draft BRA.

c) **Eliminated Contaminants**

The lists of contaminants which were eliminated from the draft assessment, along with the reason for the elimination, are not included in the draft assessment. This data must be included in the report.

Response:

See response to Comment 8. The reasons for elimination of constituents were provided in Section 2.1 of the preliminary draft BRA.

10. **Comment: Section 3.2; Identification of Potential Human Exposure Routes and Pathways, Page 3-6:**

To avoid confusion, use the same terminology that was used in the Record of Decision (ROD).

Response:

Agreed.

11. **Comment: Section 3.2.1 Area 1 Pathways:**

a) **Page 3-7, paragraph 2**

The text states that the future use assessment assumes that surface soil may consist of a mixture of surface and subsurface soils. This issue was discussed in previous meetings and stated in the letter to Joe Adams dated October 1, 1997. The agreement was to use subsurface soil concentrations as a bounding estimate for the future routine worker surface soil exposure in this area, as the use of ANY mixture of surface and subsurface soil is pure conjecture. This appears not to have been done in the draft assessment. The Area 1 assessment must be corrected to reflect our prior discussion on this issue.

Response:

At EPA's request, the draft BRA will include future scenarios for each area using subsurface soil concentrations only as a bounding estimate. Thus, the next version of the BRA will include an evaluation of future risks using both: 1) surface soil concentrations only; and 2) a bounding estimate, based on subsurface soil concentrations only.

It should be noted that, in the October 1997 preliminary draft BRA, future risks in Areas 1, 2, and 4B were calculated using only subsurface soil concentrations, since surface soil concentrations were not available at that time. Furthermore, in Area 3, subsurface soil concentrations for certain key constituents (such as lead) are lower than surface soil concentrations.

b) Page 3-8; 4th paragraph

The matter of the production wells was discussed on the teleconference on September 2, 1997. U.S. EPA had stated that without a proper assessment of the risk, there would be no justification to support the requirement of a deed restriction for using the groundwater. Furthermore, there is the issue of the enforceability of the deed restrictions. U.S. EPA had requested that both ingestion and dermal exposure to the groundwater from onsite wells for both the current and future land use scenarios would be included in the risk assessment. These groundwater pathways were not included in the draft assessment and must be included.

Response:

As discussed in Section 3.3.2 of the preliminary draft BRA, ingestion and dermal exposure of on-site workers to ground water from on-site wells was considered under the future land use scenario. Consistent with EPA's October 1, 1997 comments on the conceptual site model, this scenario was developed for a landscaper. This evaluation was based on the maximum concentration detected for each chemical in any on-site well in the lower aquifer. Data from production wells were considered, but not used, in the preliminary draft BRA because chemical concentrations measured in the production wells were generally lower than the maximum concentrations in the on-site lower aquifer monitoring wells, based on the data available in October 1997. In a meeting between EPA and the Committee on February 23rd, 1998, however, EPA indicated that it had additional data on the production wells, that were not available at the time the October 1997 BRA was prepared.

As agreed during the EPA/Committee meeting on February 23rd, the BRA will be revised to include a on-site showering scenario as well as the landscaper scenario. Both scenarios will be based on the maximum chemical concentrations detected in any production well or lower aquifer monitoring well sample. Both the monitoring well data and the production well data will be discussed in the BRA. However, the production well data will be included in the BRA only if maximum concentrations detected in the production wells exceed the maximum concentrations detected in the lower aquifer monitoring wells.

12. Comment: Section 3.2.2; Area 2 Pathways:

a) Removal Action for Area 2

Evaluation of data for this area indicates that contaminant levels are high enough to constitute harmful exposure. Our joint discussions concluded that concentration ranges of soil contaminants would drive the use of maximum values due to the presence of pure product in the area of leaking drums. Such elevated contaminant levels mandate a removal action, not a consideration of remedial alternatives. This area should be reevaluated after a removal action, using post-removal data. Conducting a routine risk assessment in the manner specified here does not make sense.

Response:

As a baseline risk assessment, the BRA should evaluate the current and potential future risks associated with the site, without consideration of the effect of the future remedial actions. For example, at EPA's request, Volume I of the BRA does not include the effect of the expedited actions already taken place at the site, including the barrier wall extraction system and perimeter ground water containment system.

As agreed during the EPA/Committee meeting on February 23rd, the BRA will continue to include an evaluation of Area 2 (the off-site containment area). However, this evaluation will be expanded to include a construction scenario, in addition to the utility line maintenance excavation scenario included in the preliminary draft BRA (see response to Comment 12b). Furthermore, to address EPA concerns regarding the heterogeneity of materials in Area 2, a bounding estimate of risk will be calculated based on the maximum chemical concentrations detected in any soil sample collected in Area 2 (see response to Comment 17).

b) Page 3-9, 1st paragraph

Any future use of area 2 would require a construction scenario. The expectation by EPA is that the future land use "excavation" worker scenario will be different from the "10 day" maintenance scenario evaluated for area 1. The construction scenario is missing, and must be included.

Response:

As agreed during the February 23rd meeting involving EPA and the Committee, the BRA will be expanded to include a future construction scenario for Area 2. Two separate construction scenarios will be evaluated: 1) the construction of a slab-on-grade building, assuming footings excavated to a depth of 4 feet; and 2) construction of a building requiring excavations to a depth of up to 10 feet. Both on-site and off-site exposures to emissions under each of these future construction scenarios will be evaluated.

c) **Page 3-9; 4th paragraph**

The draft risk assessment indicates that the use of a mixture of surface and subsurface soils constitutes a bounding estimate for the future routine worker. An equal mixture could never be a bounding estimate. EPA had discussed this with the PRPs previously; there appeared to be mutual agreement to use the subsurface soil concentration as the bounding estimate. Area 2 soil exposure calculations should be carried out using the subsurface concentrations; this calculation should be labeled the bounding estimate, given the uncertainty in any soil mixing assumption.

Response:

See response to Comment 11a. A bounding estimate of future risks in Area 2 will be calculated using subsurface soil concentrations only, as requested by EPA.

13. **Comment: Section 3.2.3; Area 3 Pathways:**

a) **Page 3-10; 4th paragraph**

As previously stated, a mixture of surface and subsurface soil cannot constitute a bounding estimate for future soil exposure in the routine worker and excavation worker scenarios. In our meetings, it was mutually agreed that subsurface soil concentrations provide the only reasonable bounding estimate. The assessment for this area must be corrected to reflect the exposure to the increased concentrations.

Response:

See response to question 11a. A bounding estimate of future risks in Area 3 will be calculated using subsurface soil concentrations only, as requested by EPA.

b) **Page 3-10; 5th paragraph**

As previously stated, the exposure during future construction activities is not evaluated. The text only describes a 10 maintenance excavation scenario (those exposure is erroneously averaged over 365 days). The evaluation for the future extended excavation worker (construction scenario) should be provided.

Response:

See response to Comment 12b. As requested by EPA, future construction scenarios in Section 3 will be evaluated in the BRA.

c) **Page 3-10; last paragraph**

Air exposures from vapor and particulate emissions to off-site residents (Area 5 residents) should be carried into the Area 5 evaluation and coupled with any exposures from other pathways to this resident population, such as groundwater exposures.

Response:

Air exposures from vapor and particulate emissions to off-site residents (Area 5 residents) were included in the Area 5 evaluation, as shown in Tables 3-4a and 3-4b. These exposure pathways were combined with other potential exposure pathways for the resident population in Section 5.1 of the preliminary draft BRA. The text of the BRA will be expanded to emphasize that these evaluations were conducted.

14. Comment: Section 3.2.4; Area 4A Pathways.

a) **Page 3-11; 2nd paragraph**

It is not clear whether the off-site residential exposure evaluated here is different from the exposure to residents in Area 5. They most certainly have different groundwater exposures, yet a separate risk evaluation for this area has not been provided. They would appear to be a subset of the off-site residential. How the risks to residents nearest to Area 4A (this is the 5B residential Area on the map provided) compare to the risks to residents east of Areas 2 and 3 (this is residential area 5A on my map) should be discussed in the assessment. It is also not clear which well data was used in the residential assessments; his should be clearly explained.

Response:

As shown in Figure 3-3 of the preliminary draft BRA, and discussed in Section 3.2.6, Area 5 was assumed to consist of off-site properties to the north, east, and southeast of the site that are zoned for industrial use but also currently include existing residences in some areas. In the preliminary draft BRA, potential off-site exposures in Area 5 to the north of the site were not evaluated any differently from potential exposures in Area 5 to the east and southeast of the site.

In response to EPA's comment, Area 5 will be divided into two separate areas: Area 5A (generally to the east and southeast of the site) and Area 5B (generally to the north of the site). Both of these areas are currently zoned for industrial use. In Area 5A, however, to the east of Colfax Avenue and along Reder Road, several small businesses and several single family residences are present. There is also a private residence and a small industrial building south of the intersection of Reder Road and Colfax Avenue, on Arbogast Avenue, in Area 5A. Area 5A was zoned for industrial use after the existing residences were built, with the intention that any future development in the area be industrial. Thus, under both current and future scenarios, the BRA will assume residential use in Area 5A.

Unlike Area 5A, there are no residences in Area 5B within approximately half a mile of the site. The area immediately north of the site in Area 5B is primarily vacant, and classified as wetlands. Further to the north, along Main Street, are small businesses and an industrial park. Because Area 5B is zoned for industrial use, and is currently composed of either wetlands or commercial/industrial development, the BRA will assume commercial/ industrial use for those sections of Area 5B which are not classified as wetlands. It will be assumed that the wetlands in Area 5B will remain undeveloped wetlands.

A revised version of Figure 3-3 will be prepared, showing Areas 5A and 5B. Areas 5A and 5B will be identified based on current and potential future land use, as described above, and ground water flow considerations. Specifically, ground water flow in the upper aquifer in Area 5A is generally to the east and southeast, while ground water flow in the upper aquifer in Area 5B is generally to the north and west. The BRA will include a table identifying which upper and lower aquifer monitoring wells and existing private wells are located in Areas 5A and 5B.

15. Comment: Section 3.2.4; Area 4B Pathways:

a) Page 3-12, 1st paragraph

As previously discussed, a mixture of surface and subsurface soils is not a bounding estimate.

Response:

See response to Comment 11a. As requested by EPA, the BRA will include a bounding estimate of future risks in Area 4B based on subsurface soil concentrations only.

b) Surface Water

The migration of groundwater to surface water was observed in this area. Some data from surface samples taken in this area was provided to the PRP group. Exposure to surface water contaminants appears to be missing in the draft assessment. This pathway must be included.

Response:

In April 1997, EPA collected a surface water sample in Area 4B. These data were included in Table 2-4 of the preliminary draft BRA. In the preliminary draft BRA, both current and future exposures to such surface water were evaluated. The text of the BRA will be expanded to clarify that risk estimates are evaluated for surface water in Area 4B for both trespassers (under current conditions) and trespassers and routine workers (under future conditions).

It should be noted that the surface water sampled by EPA is no longer present at the site. The surface water which appeared in Area 4B last spring appears to have been a

puddle of runoff, rather than a ground water discharge, and is only intermittently present in Area 4B.

16. Comment: Section 3.2.6; Area 5 Pathways:

a) Page 3-13; 1st paragraph

The usual and reasonable use of upper aquifer groundwater is incidental ingestion and dermal contact from swimming/wading pools filled using non-municipal water. The receptor population of concern is the child. This scenario should be evaluated in conjunction with the use of this aquifer as a more reasonable scenario that the one supplied in the draft assessment (watering of the lawn by a toddler).

Response:

The preliminary draft BRA did not assume watering of the lawn by a toddler. Instead, the scenario involved watering of the lawn by adults, with toddlers present who could be exposed via dermal contact and incidental ingestion. At EPA's request, an additional scenario, involving incidental ingestion and dermal contact from swimming/wading pools filled with ground water from the upper aquifer will also be evaluated for children. Consistent with the 1996 EPA draft Exposure Factors Handbook, the central tendency (CT) estimate for exposure under such a swimming/wading scenario will be based on nine days of swimming per year, for one hour per event. Under the reasonable maximum exposure (RME) scenario, it will be assumed that a child could swim in a home swimming/wading pool filled with ground water from the upper aquifer for 36 days, which corresponds to about three days a week for three months from mid-June through mid-September. Consistent with the 1996 EPA draft Exposure Factors Handbook, the swimming/wading exposure time under the RME scenario will be three hours per event.

EPA's February 10th comments do not request a scenario involving potable use of the upper aquifer ground water, instead indicating that "the usual and reasonable use of upper aquifer ground water is incidental ingestion and dermal contact from swimming/wading pools filled using nonmunicipal water." (See comment above.) However, during our February 23, 1998 meeting, EPA requested that a bounding estimate of potential future risk associated with exposure to upper aquifer ground water be based on a hypothetical potable use scenario, including drinking water. As discussed in Section 3.2.6 of the preliminary draft BRA, a survey of homes adjacent to the site performed during the Remedial Investigation indicated that private wells exist in the lower aquifer and are used for drinking water. The only wells identified as screened in the upper aquifer are located approximately one mile from the site, on Main Street, and are reportedly used only for nonpotable purposes (e.g., lawn care and gardening). It should also be noted that most residents of Griffith, including all of those with shallow wells, rely on the municipal water supply system for drinking water, and that conditions at the site do not and cannot effect the quality of the municipal water supply, as this water is drawn from Lake Michigan. However, to address EPA's comment during the February 23rd meeting, the BRA will include a bounding estimate of future risk assuming potable use of upper aquifer ground water.

17. Comment: Section 3.3.1; Exposure Concentrations in Soil:

a) Page 3-14; 1st - 3rd paragraphs

The discussion should indicate how "hot spots" are evaluated. Data from hot spot areas may not be combined with contaminant data from non-hot spot areas in the calculation of the mean or 95% UCL of the mean values. Biased sampling may provide data for exposure to hot spots, while random sampling may provide data for exposure to other locations within the site area. Site exposure should not be considered to be random if the scenario allows for focused exposure to some likely frequented site feature. Examples would include a path or trail, a pond, a work station, or any other feature that a receptor would be likely to visit more often than other portions of the site area.

Response:

An evaluation of site data indicates that, while there is heterogeneity in sample results (particularly in Areas 2 and 3), no true "hot spots" are present. As discussed in Section 5.3.1 of the preliminary draft BRA, to offset the uncertainty related to this heterogeneity, the 95th UCL of the mean for each constituent (or the maximum detected concentration if it were lower) , was used to estimate long-term exposures. Furthermore, most of the sampling conducted at the site to date has been biased, focusing on identifying areas of contamination, rather than random to specifically characterize areas of exposure. While some sample results are higher than others, there are no specific areas in either Area 2 or Area 3 which can be considered "hot spots," i.e., small areas where the majority of the most contaminated samples are located.

To address EPA's comment, a bounding estimate of potential chronic exposures to soil in Areas 2 and 3 will be conducted using the maximum concentration of each constituent detected in Areas 2 and 3. Such a bounding estimate represents "worst-case" evaluation using currently available data, since the maximum concentrations for the different constituents do not all occur at the same location, and the 95th UCL concentration is significantly lower than the maximum detected concentration for many constituents.

18. Comment: Section 3.3.2; Exposure Concentrations in Ground Water:

a) Page 3-14; Discussion

The well data which is used in the Areas 1, 4B, 5A and 5B assessments should be clearly identified. A review of data in Table 2-3 indicates that the contaminant concentration are quite variable and different by orders of magnitude (examples include Area 1 benzene levels range from 0.001 to 100 mg/L and Area 5, lead levels which include the value of 41.7 ug/L). Obviously, these are not homogeneous aquifers, and consideration of exposure to contaminant concentrations which are more representative of the actual receptor exposure should be included in the assessment. U.S. EPA, Region 5 has guidance which prohibits averaging contaminant concentrations from different areas of an aquifer. Additionally, it is not clear why the use of the maximum detected concentration is overly

conservative. EPA considers that the maximum concentration is not likely to be known at this Site. If sampling can be shown to have detected the maximum contaminant concentrations in the aquifers in the areas being evaluated, this should be explained in the risk assessment. EPA does not agree with the assumption that future excavation activities "are likely to occur at some distance from the location of the maximum concentration". This should also be explained in the assessment, or removed.

Response:

A map indicating the location of wells in each on-site and off-site area will be included in the next version of the BRA. A table identifying which wells are considered to be in each area will also be prepared.

Under the current scenario, the preliminary draft BRA generally calculated exposures and risk based on data from the "worst-case" existing off-site private well. Thus, except for lead, constituent concentrations were not averaged under the current scenario. At EPA's request, the highest detected lead concentration in any private residential well will be used in the next version of the BRA, along with a discussion of information regarding well construction and the relationship between private well lead concentrations and lead concentrations detected in the off-site upper and lower aquifers.

The approach used to estimate exposure concentrations in off-site ground water in the preliminary draft BRA is the same as that presented to EPA in the July 1997 "Exposure Pathways and Exposure Point Concentration Calculation Approaches." This document was provided to EPA for review prior to submittal of the preliminary draft BRA, and the averaging approach presented for off-site ground water did not receive any comment from EPA at that time. As requested by EPA in its February 10, 1998 comments, however, the approach to evaluating future exposure concentrations in ground water from the upper and lower aquifer will be revised in the BRA. In evaluating future residential exposures to lower aquifer ground water, the maximum detected concentrations in any off-site lower aquifer monitoring well will be used. For the shallow ground water, the data from a maximum of three wells considered to be located at the center of the off-site plume in the upper aquifer will be used to calculate future off-site exposure concentrations. At this time, it appears that two wells (MW-45 and MW-06) will be used in the BRA to define the future concentrations in the central portion of the off-site plume in the upper aquifer in Area 5A.

19. Comment: Section 3.3.4 Exposure Concentrations in Air:

a) Page 3-16; 2nd paragraph

Where site-specific data is used in place of defaults, the data should be presented and the strength of the data for use in this manner should be discussed.

Response:

Consistent with EPA guidance, the preliminary draft BRA relied on site-specific data, rather than generic defaults, where available. The site-specific data used in the evaluation

of air emissions and dispersion are presented and discussed in Appendix B to the preliminary draft BRA (see, for example, Table B-2).

b) Page 3-16; 3rd paragraph

It is not clear what ground water concentrations will be used in the modeling exercise. The use of the highest detected contaminant concentrations (which have not been shown to be the highest concentrations in the aquifer) would constitute an appropriate bounding value, and should be included in the evaluation.

Response:

The maximum ground water concentrations detected in an area will be used for the utility line maintenance excavation scenario, and for the construction scenario. For routine emissions from an entire area (for example, Area 4B), emissions will be based on the 95th UCL of the mean concentration, or the maximum detected concentration in ground water, whichever is lower, consistent with EPA guidance.

c) Page 3-16; last paragraph

Given the great uncertainty over the use and activities which may occur at the different areas of the Site, appropriate bounding estimates for the vapor emissions and particulate emission modeling would be provided by assuming that the subsurface soil concentration becomes the surface soil concentration, and soils are disturbed (both of which probably occur during excavation and during construction).

U.S. EPA has some concerns over the values have been used in the draft assessment after reviewing the lead air values derived by such modeling; these values are 2 orders of magnitude lower than any air lead levels measured during national ambient air monitoring, and would appear to be unsupportable values. Site-specific data included in air modeling and the modeling results should be included in the assessment for review. The details of the air modeling are not in Appendix C, as reported in the text.

Response:

Under the existing utility line maintenance excavation scenario, vapor and particulate emissions were estimated by assuming that the subsurface soil concentration becomes the surface soil concentration, and the soils are disturbed, as requested by EPA. The same assumption will be used in evaluating the construction scenarios requested by EPA. As discussed in previous responses, a bounding estimate of future routine emissions from soil will be calculated in each area based on subsurface soil samples only.

There is a typographical error in the first paragraph on page 3-16; the details of the emissions and dispersion models are presented in Appendix B rather than Appendix C. This appendix is identified correctly in the Table of Contents, and on page 3-18 of the preliminary draft BRA. The typographical error on p. 3-16 will be corrected.

As shown in Appendix B, EPA emission and dispersion models were used to calculate the lead concentrations in air. These models indicate that lead concentrations in air due to

wind-blown dust from the site would be low compared to normal background concentrations in air; there is no reason to assume that such wind-blown dust emissions from the site would, in fact, result in significant lead concentrations in air. As discussed during the meeting on February 23rd, the results of the emission and dispersion modeling will be compared in the BRA to ambient air monitoring conducted by Focus Environmental, Inc. (Focus) at the site during the summer of 1997. These Focus monitoring data, which were not available for the preliminary draft BRA, indicate that the emission and dispersion models used in the BRA provide representative estimates of expected concentrations in air due to site conditions.

d) Vinyl chloride

EPA has requested that migration of vinyl chloride in soil gas be considered at this site because of the large number of chlorinated hydrocarbons present, and has given the PRP group information to assist in this evaluation. Assessment of vinyl chloride is not discussed in the draft BRA, and it is not clear if such an assessment was performed.

Response:

Vinyl chloride was assessed in the BRA using the same approach used for all other volatile organic compounds (VOCs) detected in soil and ground water. As such, vinyl chloride concentrations detected in soil and ground water were used in the preliminary draft BRA to estimate current potential and future risks. The vinyl chloride data available at the time the preliminary draft BRA was performed are summarized in Tables 2-1 to 2-4 of the preliminary draft BRA.

The articles provided by EPA to the Committee regarding vinyl chloride focus on the potential enhanced carcinogenicity of vinyl chloride in children, as compared to adults, and the potential for vinyl chloride to migrate from landfills through soil gas into homes. As agreed during the meeting on February 23rd, a discussion of issues related to vinyl chloride, as identified by EPA, will be added to the Uncertainty Section. These issues are discussed briefly below.

In the preliminary draft BRA, the EPA Cancer Slope Factor (SF) for vinyl chloride was used in evaluating potential cancer risks. EPA has not indicated whether or not another SF value for vinyl chloride should be used instead. Thus, the Committee will continue to rely on the current EPA SF for vinyl chloride, unless another scientifically valid value developed in accordance with EPA protocols is provided by EPA. In any case, the articles provided by EPA regarding the potential sensitivity of children to vinyl chloride will be cited in the Uncertainty Section.

Lateral migration of vinyl chloride from the site to the closest residences through soil gas is not expected due to physical characteristics of the ACS site, although this has not been confirmed through soil gas measurements. Vinyl chloride has been detected in only two off-site upper aquifer monitoring wells, one north of the site at a concentration below the MCL (in MW-39), and one just southeast of the site at concentrations at or just above the MCL (in MW-6). Thus, there is no evidence of vinyl chloride migration in the upper aquifer into the residential areas. Furthermore, because of the relatively high ground water table, the vadose zone in the southern portion of the site, near the residential areas,

is relatively shallow (approximately 10-15 feet). Since the nearest homes are located several hundred feet away from the site, and the vadose zone is shallow, lateral vinyl chloride migration from the site through soil gas to the homes would not be expected. Furthermore, as an expedited action, a barrier wall has been constructed through the vadose zone around the major portion of Areas 1, 2, and 3, significantly reducing or eliminating the potential for off-site migration of vinyl chloride.

20. Comment: Section 3.4.3; On-site Trespasser Intakes:

a) Surface Water Contact

Standing water (actually, contaminated standing water) was detected in Area 4B. As per our discussions, it was mutually agreed that contact of a trespasser with Surface Water would be evaluated for Area 4B. This exposure pathway must be included in the assessment.

Response:

See response to Comment 15b.

21. Comment: Section 3.4.4; Vinyl Chloride, Off-site Resident Intakes

Migration of vinyl chloride in soil gas should be evaluated for Areas 5A and 5B, and in any other Area in which methane or other VOC migration has been detected. EPA has previously provided the PRP group with some methodology and guidelines for this evaluation.

Response:

See response to Comment 19d.

22. Comment: Section 3.4.5.1; Contact Rates/ Routine Industrial Worker

a) General Comment

The scenario description does not explain whether this is the present land use (ACS Site) worker or the future on-site industrial worker. Perhaps the scenario should be relabeled, as the assumptions are not consistent with a typical routine industrial worker scenario. The manner in which these scenarios could differ should be discussed, and the differences in risk for a future industrial worker presented.

Response:

Section 3.4.5.1 provides contact estimates for both the current land use (ACS) site scenario for the routine worker, and for hypothetical future on-site routine workers. The contact rate assumptions are the same under both the current and future scenarios, except as indicated in the text. At EPA's request, the text will be clarified to emphasize any differences in assumptions between the current and hypothetical future routine worker scenario contact rates.

b) Page 3-21. First Bullet. Incidental Ingestion

The incidental ingestion rates reported here are inconsistent with the EPA values of 100 mg/day for the RME exposure and 50 mg/day for the CT exposure for a non-contact intensive (indoor) worker. (Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure, November 1993.) EPA has noticed that the 1993 reference was not used consistently throughout the BRA.

In addition, EPA considers that a value of 100 mg/day is more typical (read as an average or CT value) for an outdoor worker, such as the receptor described in this scenario. EPA suggests that a higher ingestion rate would apply to the time spent outdoors in the RME scenario. For these reasons, the values used in the draft BRA in the routine worker scenario are unacceptable to EPA for the time spent outdoors by this receptor.

Response:

As discussed in Section 3.4.5.1 in the preliminary draft BRA, the incidental soil ingestion rates of 50 milligram of soil per day under the high end scenario, and 25 milligram of soil per day under the typical scenario, are based on EPA's 1991 "Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors" (OSWER Directive 9285.6-03), and soil ingestion rates presented in Calabrese et al. (1990). According to Attachment B of OSWER Directive 9285.6-03, Calabrese et al. (1990) conducted a pilot study that measured adult soil ingestion at 50 mg/day. The 1991 OSWER Directive further specifies that the values presented, including the default soil ingestion rate of 50 mg/day, are "intended to be used for calculating reasonable maximum exposure (RME) levels for each applicable land use scenario at a site." The central tendency value of 25 mg/day was estimated as one-half of the RME value. It should be noted that, in the preliminary draft BRA, the on-site worker scenario also includes ten days of exposure at a soil ingestion rate of 480 mg/day, the soil ingestion rate recommended in the 1991 OSWER Directive for activities such as yardwork or construction, which may result in greater soil ingestion.

EPA's comment refers to 1993 guidance entitled "Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure." ENVIRON's version of this document is labeled a "Preliminary Review Draft" and is dated May 5, 1993. The May 5, 1993 document includes several gaps and blank sections, with handwritten notes, and does not appear to have ever been finalized by EPA. EPA has just provided the Committee with a slightly more recent version, dated November 4,

1993 (received March 9, 1998). This is also marked draft and still includes several gaps and blank sections. Neither draft is available from NTIS, and to the Committee's knowledge, is not considered by EPA Headquarters to have superseded the 1991 OSWER Directive. The October 1997 preliminary draft BRA relied on the May 1993 draft document only for estimating central tendency (CT) exposure values, which are not provided in the 1991 OSWER Directive. Thus, the Committee believes that the default RME values in the 1991 OSWER Directive should take precedence over the RME values in the 1993 draft guidance.

In the 1993 draft guidance, the adult soil ingestion rate is estimated as 100 mg/day (for the RME scenario) and 50 mg/day (for CT scenarios). Either value would represent the total amount of soil ingested by an adult over the course of the day. The tables included in the 1993 guidance document indicate an RME soil ingestion rate of 100 mg/day for adults under both non-contact-intensive residential and non-contact-intensive occupational scenarios. This high end rate of 100 mg/day corresponds to RME exposures for adults, which would be expected to take place during the adults 16 waking hours. Assuming that the adult spends half of these 16 waking hours at work (for an 8-hour work day), the high- end soil ingestion rate for the adult would still be 100 mg/day, but about half (or 50 mg/day) would be assumed corresponds to the time spent at the residence and about half (50 mg/day) would be from the workplace. Thus, consistent with the 1991 OSWER Directive guidance, the high-end estimate of soil ingestion by an adult at his or her work place would be 50 mg for an 8-hour work day. This approach assumes that there is equal opportunity for soil ingestion at work and at home. The "worst-case" assumption, which appears to be recommended in EPA's comment, is that all of the soil ingested by an adult during the 5-day work week would occur at work, and none of it would occur at home. It should be noted that the 1993 Draft Guidance also emphasizes that the fraction of soil ingested from the contaminated source should be given consideration when evaluating this exposure pathway. Assuming an RME soil ingestion rate of 100 mg/day for an adult at the work place assumes that this fraction ingestion value is 1.0; i.e., no soil is ingested from the home during the 5-day work week.

As discussed above, the Committee strongly believes that the 1991 OSWER Directive is the appropriate basis for selecting an RME soil ingestion rate for occupational exposures, and that the appropriate RME value is 50 mg/day. However, in order to resolve this issues, it was agreed at the February 23 meeting with EPA that the high-end soil ingestion rate for a worker in the ACS BRA will be increased to 100 mg/day, with a central tendency soil ingestion rate of 50 mg/day. These values were selected to be consistent with Region 5 policy regarding soil ingestion rates for adult residential and occupational scenarios. The additional ten days of exposure at the higher ingestion rate of 480 mg/day previously assumed in the preliminary draft BRA will also be retained in the current and future worker scenarios.

c) Page 3-21. Second Bullet. Dermal Contact

The Dermal Exposure Assessment: Principles and Applications, EPA/600/8-9/011B, January 1992 guidance is not to be replaced with the data from the August 1996 Draft Exposure Factors Handbook. The EPA guidance still requires that the soil-to-skin adherence factors of 1.0 and 0.2 mg/cm2-event be used for the RME and CT scenarios,

respectively. While the dermal guidance is currently under review, EPA has not yet issued new guidance for the dermal pathway.

The methodology described in Volume 1, Chapter 6, of the Draft Exposure Factors Handbook (August 1996) may be used to derive a bounding estimate in the uncertainty section. Because this methodology considers exposure of the whole body surface to dust exposure, rather than the use of the input value of 5800 cm2 (or 25% of the body area) recommended in the 1992 Dermal Guidance, it is not certain whether this will result in a lower or an upper bounding value. It will depend on the scenario. In any case, the derivation of the values to be used for the median (CT) and upper bound (RME) dermal soil loading rates needs to be clearly shown in the draft BRA. This includes the body surface area used, the % of body surface due to each body part, how the adherence values for each body area was developed and the adsorption values for each body area. Simply listing a value, such as 227 mg/day for the RME routine worker, is neither supportable nor good science. It should be noted that this RME value is considerably lower than the traditional CT input value (5000 cm2 x 0.2 mg/cm2/day = 1000 mg/day), so some explanation for this low value is clearly expected.

The reference to the Kissel et al. (1996) study used in the dermal calculation is missing. EPA does not use the 95% UCL of the mean for the RME intake parameter, but rather the 90th or 95th percentile value on the distribution. This is different than the 95% UCL on the mean for the adherence factor for each body part. The text should more clearly explain what is meant by the "95% UCL value" in this case.

For the CT calculations, the text of the draft BRA must explain how the geometric mean value was obtained from the Kissel data, and why a geometric mean rather than an arithmetic mean is calculated for this parameter, given the sparse data available. Actually, it is not clear how these values were derived because it is not discussed in the draft BRA.

EPA has been working with Dr. Kissel to derive values that may be useful for risk assessments. Kissel has indicated that the grounds keepers studied wore gloves, and that this data set should not be used for risk assessment purposes, so a different data set may need to be identified if this calculation is included in the assessment. This set of problems with the dermal risk calculations further supports the need to provide parameter inputs to EPA for review before proceeding with such calculations.

Response:

As discussed in Section 3.4.5.1, the approach used in the preliminary draft BRA for estimating dermal adherence adopts the approaches, input data, and assumptions presented in the EPA's 1996 Draft Exposure Factors Handbook, and detailed in Kissel et al. (1996). (The Kissel et al. (1996) article was inadvertently left out of the reference section to the preliminary draft BRA, but subsequently was provided to EPA.) The preliminary draft BRA relies on the 95% Confidence Interval (CI) on the mean values, as presented and recommended in Kissel et al. (1996) and the 1996 EPA Draft Exposure Factors Handbook. A discussion of how these values are calculated is presented in Kissel et al. (1996). As an additional level of conservatism, in the RME scenario, the highest 95% CI value calculated for any of the five groundskeepers considered in the Kissel et al. (1996)

study was used in the preliminary draft BRA. The Kissel (1996) article is identified in the EPA 1996 Draft Exposure Factors Handbook as "the key dermal adherence soil study."

The Committee believes that the Kissel et al. (1996) approach and data are the most scientifically defensible for estimating soil dermal adherence in the BRA. Earlier studies of dermal adherence to soil, such as those summarized in EPA's 1992 "Dermal Exposure Assessment: Principals and Applications" (EPA 1992) are limited in several respects, including:

- The earlier studies measured dermal adherence to hands only. Dermal adherence to other parts of the body were not measured. According to EPA (1992), "parts of the body that have less intimate contact with the soil will likely have lower values" (p. 8-17). In contrast, Kissel et al. (1996) provides measurements of soil adherence on hands, arms, face, legs and other body parts; his measurements confirm the EPA (1992) belief that dermal adherence to hands is greater than to other parts of the body.

- The previous studies cited in EPA (1992) generally involve experimental conditions that do not reflect typical dermal exposure conditions, or are limited to children. Furthermore, the earlier studies do not attempt to relate soil dermal adherence to specific activity. In contrast, Kissel et al. (1996) provide measured dermal adherence values for both children and adults performing a variety of different activities, including activities that are directly relevant to exposure scenarios in the BRA (e.g., a groundskeeper scenario for the routine worker, and an irrigation line installer for the routine maintenance excavation worker). In its comments, EPA notes that the groundskeepers in the Kissel et al. (1996) studies wore gloves; in fact, according to Kissel et al. (1996) the grounds keepers wore gloves "intermittently," as might be expected for routine workers at the ACS site.

For the reasons discussed above, the Committee believes that the Kissel et al. (1996) approach and data, as summarized in EPA's draft 1996 Exposure Factors Handbook, represent the most scientifically defensible way to evaluate dermal adherence in the BRA. However, to resolve this issue and respond to EPA's comment, the BRA for the ACS site will also include an evaluation of dermal adherence assuming the USEPA (1992) default values of 1.0 and 0.2 mg/cm^2-event for the RME and central tendency scenarios, respectively. Both evaluations will be presented in the main text of the report.

d) Page 3-22, Bullet. Ingestion of Groundwater

The statement in the second sentence "Such activities using water from an on-site well are not known to take place at the Site, but could hypothetically occur" suggests that this scenario is not meant to apply to the current on-site workers. Discuss the receptor who is used in this scenario. Water from on-site wells has been used in the recent past. The text indicates that the scenario applies to all future land uses, as well as the restricted land use discussed in the report. The text in the BRA should be consistent with the intended receptor population.

No one can not predict how this land will be used in fifty or one hundred years. The BRA should attempt to be more inclusive or only the more conservative scenario should be evaluated. The reason for the current scenario is to determine if a removal action is needed or an interim restriction on site activities, such as on-site excavations, should be instituted. Such statements which confuse the BRA should be eliminated.

Response:

The text will be clarified to emphasize that there is no on-site use of ground water currently at the site. Thus, use of lower aquifer ground water from an on-site well will be evaluated only as a future hypothetical on-site scenario.

e) Page 3-2; First paragraph

This paragraph is both redundant and inconsistent with the explanation for the ground water ingestion rate presented in the previous paragraph (page 3-22). This paragraph should be omitted.

Response:

As indicated in the first line of the first paragraph on page 3-23 ("under the typical scenario..."), this paragraph refers to the CT evaluation in the risk assessment. The previous paragraph at the end of page 3-22 ("under the high-end scenario...") refers to the RME scenario. In response to the EPA comment, further clarification and distinction between the RME and CT assumptions will be added to the text.

f) Pace 3-23, Bullet, Groundwater Dermal Contact

The U.S. EPA RME default skin surface area for outdoor contact is 5800 cm2 or 25% of the body surface area , with a value of 5000 cm2 recommended for the CT soil contact scenario (Dermal Guidance, 1992). The values of 3100 cm2 and 2000 cm2, quoted in this draft BRA are not consistent with the recommendations in Table 8-6 of the Guidance, although this documented is quoted as the reference for these values. It is also not consistent with the methodology presented in the Exposure Factors Handbook. The values in Table 8-6 of the 1992 Dermal Guidance (58000 cm2 and 5000 cm2) would appear to be more appropriate in this scenario assessment, unless some sound rationale can be offered for a reduced values. No explanation is offered in the draft BRA.

Response:

The text referred to in the EPA comment corresponds to dermal adherence under the ground water scenario. EPA's comment appears to recommend values of 5,000 cm^2 for the central tendency scenario) and 5,800 cm^2 (for the RME scenario - it is assumed that the value of 58,000 cm^2 actually indicated in the EPA comment is a typographical error). The values of 5,000 cm^2 and 5,800 cm^2 are taken from Table 8-6 of EPA's 1992 Dermal

Guidance, where they are actually recommended for soil, rather than ground water contact, as implied by the EPA comment.

As discussed on page 3-23 in Section 3.4.5.1, the values of 3,100 cm^2 and 2,000 cm^2 used in the preliminary draft BRA are based on the body surface area data presented in EPA's 1992 Dermal Guidance document, and correspond to head, forearms, and hands (for the RME scenario) and head and hands (for the CT scenario). The higher values recommended by EPA in its comment (5,000 cm^2 and 5,800 cm^2) roughly correspond to 25% of the total skin area, or approximately the head, hands, forearms, and lower legs. Although the Committee believes that it is unlikely that such extensive contact with ground water will occur, the BRA for the ACS site will be modified to use the higher values, as requested by EPA.

g) Page 3-23. last paragraph

The Supplemental Guidance, Dermal Risk Assessment, dated August 18, 1992, Appendix A, contains a list of chemicals for which dermal exposure in water should be considered. The permeability coefficients (Kp's) for each chemical in the list are included. These values should be used in the Site risk assessment for consistency with other Region 5 assessments. This document was listed in the reference list.

Response:

The Committee has evaluated the permeability coefficient (Kp) values presented in EPA's January 1992 Dermal Exposure Assessment document, and in EPA's August Supplemental Guidance document. As discussed during our February 23, 1998 meeting, it appears that either the values in the August 1992 Supplemental Guidance are incorrect, or the equations presented in the 1992 Supplemental Guidance and the 1992 Dermal Exposure Assessment document are incorrect. The Committee will continue to rely on the values presented in the January 1992 EPA Dermal Exposure Assessment document pending EPA's further evaluation of this issue.

23. Comment: Section 3.4.5.2; Exposure Frequency/Routine Worker

a) Page 3-24. First paragraph

The draft document "Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure", 1993, allows for a CT occupational exposure of 219 days, based on an average for all full and part-time workers. If part-time workers are not expected at the Site, the value of 250 days/year is a more reasonable value. These are values typically used in Region 5 risk assessments, and should be used in this assessment for consistency.

Response:

Consistent with EPA's comment, the BRA will be based on an occupational exposure frequency of 250 days/year for the RME scenario, and 219 days/year for the CT scenario.

b) Page 3-25, FI term

The derivation of the fraction ingested (FI) ratio has neglected to include two critical elements: first, that the amount of time spent outdoors typically accounts for a higher portion (55% for children) of the daily soil ingestion (see input values in the assessment of lead ingestion in the IEUBK Model). Second, the ingestion of soil during the remaining time occurs at a similar concentration. Discuss whether it is presumed that the maintenance worker spends the balance of the time indoors. Because the available data is specific to children, EPA does not usually segment the adult soil ingestion in the manner presented in the assessment, but assumes that the default soil ingestion reflects ingestion of both outdoor soil dust and indoor soil-derived dust, and that the contaminant concentrations are similar. When it is clear that the ingestion rate may be higher because the worker scenario includes both outdoor and indoor exposures, it is appropriate to use an outdoor exposure rate for portion of the time and the indoor worker exposure rate (100 mg/day) for the portion of time spent indoors.

It is recognized that this method of assessment may not be conservative for contaminants which degrade in UV light (as no degradation takes place indoors and measured indoor contaminant levels are usually higher). In any case, the overall soil ingestion contact frequency is not reduced to 188 days or 45 days/year, as suggested here, and the entire worker time needs to be included.

Response:

As agreed during the February 23, 1998 meeting, the fraction ingested (FI) term will be conservatively set at 1.0 in the BRA, consistent with EPA's comment. This value of FI will be used based on the assumption that the default soil ingestion rate of 100 mg/day reflects ingestion of both outdoor soil dust and indoor soil derived dust, and that the chemical concentrations in both the outdoor soil and the indoor dust are similar. This assumption has relatively little effect on the RME scenario in the preliminary draft BRA (where an FI value of 0.75 was used), but will increase the predicted soil ingestion for the CT scenario (where an FI term of 0.18 was calculated).

b) Page 3-25, Second Bullet, Soil Contact Frequency

A reasonable assumption here would be that the worker contacts indoor soil-derived dust for the balance of the duration. This exposure appears to be missing in the assessment, and should be included to be consistent with the ingestion scenario.

Response:

As requested by EPA, the frequency of dermal contact with surface soil will be modified to reflect the assumption that the dermal adherence factors reflect contact with both outdoor soil and indoor soil derived dust, and that indoor and outdoor contaminant concentrations are similar. Thus, in estimating dermal contact risk, exposure frequency will be 250 days under the RME scenario and 219 days under the CT scenario, with a fraction contacted (FC) term conservatively set at 1.0 for both RME and CT scenarios.

c) **Page 3-26. Second Bullet. Inhalation**

The inhalation rate used in this assessment is not specified here or in Tables 3-5 or 3-6. EPA suggests the use of activity-specific inhalation rates over the 8 hour/day exposure duration as a more reasonable approach than prorating the residential inhalation rate.

Response:

Consistent with EPA guidance, calculated concentrations of chemicals in air were compared directly to EPA Reference Concentration (RfC) values and Unit Risk Factor (URF) values in the preliminary draft BRA. Thus, it was not necessary to specify inhalation rates in the BRA.

As discussed during our February 23, 1998 meeting, predicted ambient air concentrations are averaged in the BRA to reflect exposure frequency and duration. However, to reflect the potentially higher inhalation rate that might be expected for an outdoor worker at the ACS site, predicted concentrations in air will not be reduced to reflect the 8 out of 24-hour duration of exposure for on-site workers.

24. Comment: Section 3.4.5.3; Exposure Duration/Routine Worker

The EPA 1993 Default Exposure Guidance document lists 20 and 5 years as the reasonable input values. Unless values from the new USDOL data is properly supported to EPA, it must be omitted.

Response:

As cited on page 3-27 of the preliminary draft BRA, 1997 data from the U.S. Department of Labor (USDOL) indicates values of 20 years and 4 years, respectively, as appropriate RME and CT values for exposure duration. However, in response to EPA comments, the BRA will use the EPA 1993 standard default values of 20 years and 5 years, respectively, for RME and CT scenarios.

25. Comment: Section 3.4.5.5; Averaging Time

The text properly recognizes that the noncarcinogenic averaging time should reflect the exposure duration in days. While the averaging time will probably be greater than the actual exposure time because exposure only occurs 5 out of 7 days a week, the exposure for noncarcinogens should not be averaged over time periods when no exposure occurs. An example would be the 40 day groundwater exposure which only occurs in summer months (perhaps 16-18 weeks). The values shown in Tables 3-5 and 3-6 do not represent reasonable averaging times for short-term exposures.

Response:

The longer averaging time used in the preliminary draft BRA was used to evaluate the potential incremental effect of short-term exposures on chronic long-term risk. In response to EPA's comment, in addition to chronic exposures (which will be assumed to apply to all continuous exposures of one year or longer in duration), the BRA will be expanded to include an evaluation of subchronic risks (which will be assumed to correspond to exposure scenarios with averaging times of greater than 10 days but less than 1 year) and acute exposures (which will be assumed to correspond to exposures of up to 10 days). In general, acute noncancer toxicity criteria are only available for the inhalation pathway. Thus, acute exposures through pathways other than inhalation (e.g., dermal contact) will be evaluated quantitatively only for cancer risks, and qualitatively for noncancer risks.

26. Comment: Section 3.4-5.1 Contact Rates/Excavation Workers

a) General Comment

The purpose for this scenario is not completely clear. If the excavation work is done by present Site workers or the future industrial routine/maintenance worker, it should be included as part of that scenario. If this scenario is meant to reflect the more conservative construction scenario, the values are not appropriate. Because both the present Site use and any future industrial use would require some construction activities, the risk associated with a longer duration, more contact intensive exposure should be evaluated. EPA had expected that the "excavation" scenario was term used in the text as the construction scenario. EPA is surprised to see that this critical scenario is missing in the draft BRA. The construction scenario must be included, and the excavation scenario put into perspective.

Response:

As discussed in Section 3.4.6, the purpose of this scenario is to evaluate workers who "engage in excavation activities in order to maintain underground utility lines without wearing the proper personal protective equipment" (p. 3-28). In the risk characterization section (Section 5 of the preliminary draft BRA), the risks associated with such

excavations are presented both separately, and when combined with other exposures of routine workers.

As indicated in response to Comment 12b, a longer construction scenario involving excavation will also be evaluated for Areas 2 and 3 in the revised BRA.

b) Page 3-28, First Bullet, Soil Ingestion Rate

There are a number of datasets in the literature. While the Kissel data suggest a lower value, it is not certain if the 8 irrigation workers in this dataset were wearing gloves (as the grounds keepers were). The data on adult ingestion collected by Calabrese would suggest that the intake can be quite variable, and a much higher value could be supported. In addition, we have not seen any tracer data from Kissel et al., and do not believe that his data can be extrapolated to derive ingestion rates. EPA requests that such biased statements be removed from the BRA.

Response:

At EPA's request, the last two sentences in the first bullet under Section 3.4.6.1 will be deleted. However, the Committee does not believe that the statements are biased. As stated in the text of the preliminary draft BRA, the high-end ingestion rate of 480 mg/day is derived from Hawley (1985) based on high dermal loading estimates. If the data presented in Kissel et al. (1996) are used instead of the Hawley (1985) data to estimate dermal loading, the high-end soil ingestion rate of 480 mg/day would be significantly reduced. As previously discussed, it is acknowledged that the groundskeepers and irrigation workers in the Kissel et al. (1996) study wore gloves intermittently. This is consistent with expected behavior of routine workers and excavation workers at the ACS site.

c) Page 3-28, Second Bullet, Dermal Contact Rate

As previously stated, EPA finds the values derived using the Kissel data unacceptable. The Kissel (1996) reference is not listed. EPA is still trying to identify upper-bound values suitable for use in deriving the soil adherence values for the RME exposure. The use of the mean adherence values (which are more similar to average or CT intake values) would not be appropriate for the RME exposure rate. Also, the irrigation worker soil adherence was measured after only 3 hours, and the workers in the Site scenario are assumed to work for 8 hours. Kissel does have some end of day means and standard deviations for construction workers (a better match for the ACS construction workers); the upper value appears to be 1.49 (or 1½ times the EPA value for the RME).

The mean would be a more appropriate value for the CT than the geometric mean value used in the text, given the sparse data. The draft BRA neglects to include that the new methodology described, which uses a skin adherence factor, is recommended when whole body surface area contact is to be considered, a match matching data set can be identified and supported and that the confidence in this estimate is low. As noted previously, EPA has not issued new guidance for the Dermal Contact pathway, and it is

expected that the 1992 Dermal Guidance recommendations will be used in the BRA until new guidance is available. Other data can be used to derive bounding estimates.

Response:

As previously discussed in response to Comment 22c, at EPA's request the BRA will incorporate a dermal loading scenario based on the EPA (1992) default values of 0.2 and 1.0 mg/cm^2- event for CT and RME dermal adherence factors, respectively, in addition to the dermal loading scenario based on Kissel et al. (1996).

Contrary to the EPA comment, the mean adherence values presented by Kissel et al. (1996) were not used in the preliminary draft BRA for RME exposures. Instead, as indicated in the preliminary draft, and as recommended in the 1996 EPA factors handbook, the 95% CI adherence factor for the irrigation worker in the Kissel et al. (1996) study was used to estimate RME dermal adherence. The mean values from the irrigation worker were used to estimate the CT dermal adherence for the excavation worker.

As indicated by EPA in its comment, the dermal adherence for the irrigation installers was measured after three hours. More recent data for utility workers (involved in cleaning, fixing mains, and excavation) and construction workers (involved in mixing earth, dust, and debris) are now available on the Kissel laboratory web site (http:\\weber.u.washington.edu). The dermal adherence factors for such utility and construction workers, measured after a minimum of 8 hours, are similar but somewhat higher than for the irrigation worker previously reported in Kissel et al. (1996). However, the 95% CI for hand loadings for the utility workers are still lower than the RME default of 1.0 mg/cm^2 recommended by EPA. The Kissel web site does not present an upper value of 1.49, as cited by EPA in its comment.

As previously discussed, the geometric mean, and 95% CI on the geometric mean, were used in developing dermal adherence values in the preliminary draft BRA, consistent with recommendations in the 1996 EPA draft Exposure Factors Handbook (see Chapter 6 of Volume I of the Exposure Factors Handbook).

e) Page 3-29, second paragraph

Section 3.4.1.1 is missing. The reference here and in the next section appears to be incorrect. Rectify the discrepancy.

Response:

The typographical error in the text will be corrected.

f) Page 3-29, Dermal Contact with Groundwater

As in the routine worker scenario, EPA finds the skin surface areas to be inconsistent with the Default Exposure guidance (1993) values. No justification for the values given (3100 cm2 and 2000 cm2 ,or the RME and CT, respectively) are found in the draft BRA.

Chemical-specific permeability factors from the Supplemental Dermal Guidance should be used where available.

Response:

As previously discussed in response to Comment 22f, the BRA will be revised to calculate dermal adherence to ground water based on surface areas of 5,000 cm^2 (for the central tendency scenario) and 5,800 cm^2 (for the RME scenario).

The justification for the 3,100 cm^2 and 2,000 cm^2 values used in the preliminary draft BRA has already been discussed in response to Comment 22f, and is provided on 3-23 of the preliminary draft BRA. Contrary to the EPA comment, there are no skin surface areas presented for a routine worker scenario in the EPA's 1993 Default Exposure guidance. It is assumed that EPA is referring to EPA's 1992 Dermal Exposure guidance.

As discussed in response to Comment 22g, it appears that there is an error in the tables on chemical-specific permeability factors in EPA's 1992 Supplemental Guidance. Thus, the permeability factors provided in EPA's 1992 Dermal Exposure document will continue to be used, pending final EPA review of the values and equations in the 1992 Supplemental Guidance.

27. Comment: Section 3.4.6.2 Exposure Frequency/Excavation Worker

a) Page 3-30, First Bullet, Frequency of Ingestion

It is not clear how the very limited exposure to the excavation worker (10 days) can be used to determine if there is a long-term risk to anyone. This is an acute scenario, and needs to be expanded under the future land use to include a construction scenario. (Any future use will involve some construction activities). A reasonable scenario, which encompass at least 9 months of construction activities, should be developed. The averaging time should be consistent with the time frame of the construction activities for non-carcinogens.

Response:

At EPA's request, a long-term construction scenario will be included for Areas 2 and 3. See response to Comments 12b and 13b.

b) Page 3-3G, Second Bullet. Frequency of Dermal Contact

See above comment.

Response:

See response to Comment 27a.

c) **Page 3-30, Third Bullet, Frequency of Inhalation**

See above comment. In addition, EPA recommends that activity-specific inhalation rates be used to derive appropriate inhalation rates for the 8 hr exposure day, rather than a proration of the residential inhalation rate.

Response:

See response to Comment 27a, and Comment 23c.

d) **Page 3-30, Fourth Bullet, Frequency of Contact with Groundwater**

See above comment.

Response:

See response to Comment 27a.

28. **Comment: Section 3.4.6.2; Exposure Duration/Excavation Worker:**

a) **First and second bullets**

The ten day high contact exposure over 20 years more correctly constitutes a part of the routine worker/maintenance worker exposure scenario. The chronic exposure to a construction worker should be evaluated using exposure period of more typical duration, usually 9 months. EPA expects that a construction scenario of such reasonable duration be evaluated at all commercial/industrial sites. The limited excavation scenario described here does not satisfy the needs of the assessment.

Response:

See response to Comment 12b.

29. **Comment: Section 3.4.7.1; Contact Rates/Trespasser:**

a) **Page 3-31, Incidental Ingestion**

The ingestion rate presented here, 10 mg day, is not well supported and is not acceptable to EPA. While a trespasser aged 9-18 years may be awake for 16 hours, it is unlikely that he spends more than 3-4 hours/day outdoors as an upper-bound. The draft BRA uses 1.5 hours as an assumption of the typical time spent outdoors by this receptor population. Because the outdoor exposure is a "dirtier" exposure, most of the soil ingestion occurs during this outdoor time. U.S. EPA (Region 5) considers a reasonable (standard) RME trespass scenario to consist of 54 days a year at 4 hours a day, while the CT exposure scenario provides for a reduced number of days at 2 hours/day. Therefore, it is reasonable to believe that between 50% and 100% of the daily adult ingestion rate occurs

during the trespass exposure. These inputs give appropriate bounding estimates for the trespass scenario, and must be used in the draft BRA.

Response:

In this comment, EPA does not provide any basis for assuming that an individual would spend three to four hours per day as a trespasser at the site for a total of 54 days a year under an RME scenario, or two hours per day for a total of 54 days per year under the CT scenario. Based on these assumptions, it would be assumed that a trespasser would spend 216 hours per year (or the equivalent of more than five 40-hour weeks) at the site under an RME scenario, and 108 hours per year (or the equivalent of more than two 40-hour weeks) at the site under the CT scenario.

As stated in Section 3.4.7.1, it was assumed in the preliminary draft BRA that a trespasser would spend 1.5 hours per day for a total of 52 days per year at the site under an RME scenario. This scenario is highly conservative; for example, EPA's 1996 draft Exposure Factors Handbook indicates that the total amount of time spent outdoors by individuals 12 years and older averages only 1.5 hours per day. Thus, it is assumed that 100% of the time spent outdoors is spent trespassing at the site for a total of 52 days per year under the RME scenario in the preliminary draft BRA.

Given the relatively small amount of time that the trespasser is likely to spend at the site, the Committee believes that it is unreasonable to assume that 100% of the soil ingested over the course of a day would come from the site, as requested by EPA. However, to resolve this issue, the BRA will be revised to include the following trespasser scenarios:

- Under the current scenario, it will be assumed that trespassing occurs less frequently within the fenced portion of the site (i.e., Areas 1, 2, and 3). For these areas, under an RME scenario, it will be assumed that a trespasser enters the site one day each week from April through October, for a total of 30 days per year. The CT scenario will assume one day per week for the months of June, July and August for a total of 12 days per year. Under both RME and CT scenarios, it will be assumed that an individual will spend 1.5 hours at the site during each trespassing event. Given this limited amount of time at the site, the soil ingestion rates will be conservatively assumed as 50 mg/day under the current RME scenario, and 25 mg/day under the current CT scenario. The exposure duration under the current scenario will be 10 years (RME scenario) and 2 years (CT scenario), as previously assumed in the preliminary draft BRA.

- Under a hypothetical future trespassing scenario, it will be conservatively assumed that changes at the site could result in a greater frequency of trespassing. Thus, under the future scenario, the standard default Region 5 trespasser scenario, as described by EPA in its comment, will be used for all on-site areas. Under this scenario, the frequency of trespassing will be 54 days/year under the RME scenario and 12 days/year under the CT scenario. It will be assumed that an individual will spend 4 hours per day at the site under the RME scenario and 2 hours per day under the CT scenario. The soil ingestion rate will be 100 mg/day

for RME scenario, and 50 mg/day under the CT scenario. The Region 5 default assumptions will also be used under the current scenario for Areas 4A and 4B, since they are not fenced, and are thus potentially more accessible to trespassers than Areas 1, 2, and 3.

b) Page 3-32, Dermal Contact/Trespass

As stated previously, Kissel has indicated that the grounds keepers wore gloves, and that this data should not be used to derive estimates for other exposure scenarios. It is not expected that the trespassers will wear gloves. Assuming that they will is not acceptable to EPA. EPA requires use of the values for the soil adherence rate (1.0 mg/cm2 for the RME and 0.2 mg/cm2 for the CT exposure) in the 1992 Dermal Guidance. This guidance should be used to derive an exposures for this Site in areas 1,2, 3 and 4B. In addition, EPA does not know from where the 95% UCL adherence factors used in thee assessment are derived or why a UCL mean value rather than a 90th or 95th percentile of the distribution should be used.

It is not clear why the geometric rather than the arithmetic mean used for this parameter in the CT calculation. Appropriate Kissel data may provide a basis for a bounding estimate, but the confidence in that data at present is very low. See also above comments on this issue.

Response:

As requested by EPA, the BRA will include a scenario for the trespasser based on the soil adherence rates of 0.2 and 1.0 mg/cm^2 for the CT and RME scenarios, respectively. See response to Comment 22c.

It is acknowledged that groundskeepers in the Kissel et al. (1996) study wore gloves intermittently, while trespassers are not expected to routinely wear gloves. Thus, in adapting the Kissel et al. (1996) data for the trespasser scenario, the EPA standard default values of 0.2 and 1.0 mg/cm^2 will be used to determine loadings to hands in place of the hand loading data presented for groundskeepers in Kissel et al. (1996).

c) Page 3-33, First Bullet, Ingestion Rate for Surface Water

It is not clear where the trespasser exposure time of 1.5 hours/day comes from, as the source is not clearly identified. U.S. EPA, Region 5 uses 4 hours/day for a standard RME trespass exposure and 2 hours/day for the CT scenario. The draft BRA uses the same exposure time for both the RME and the CT scenarios, which does not make much sense. This must be rectified.

Response:

The basis for the exposure time 1.5 hours/day for the trespasser scenario is identified on page 3-33 of the preliminary draft BRA as EPA's 1996 Exposure Factors Handbook [i.e., "a trespasser is expected to be on facility property for 1.5 hours per day under the high-end and typical scenarios, consistent with the estimated 1.5 hours spent outdoors by

individuals 12 year and older (USEPA 1996b")]. In its comments, however, EPA does not present the basis for assuming 4 hours/day for standard RME trespasser exposure, and 2 hour/days for the CT scenario.

The trespasser scenario will be modified as presented in response to Comment 29a.

d) Page 3-33, Dermal contact with Surface Water

As previously stated, the chemical-specific permeability coefficients listed in Appendix A of the Supplemental Dermal Guidance should be used when available.

Response:

See response to Comment 22g.

30. Comment: Section 3.4.7.2; Exposure Frequency/Trespasser:

a) First Bullet, Frequency of Incidental Ingestion

The 52 days/year is similar to the standard Region 5 trespass scenario of 54 days/year, with the major difference that EPA does not expect that children will trespass on the site in winter. The EPA scenario assumes 1 day/week in April, May, September and October and 3 days/week in summer months of June, July and August as a basis for the 54 day exposure. This exposure scenario is more probable, does not require the derivation of the more speculative FY term, and is required for trespass scenarios in Region 5. The non-carcinogenic risks from these exposures should be averaged over 7 months.

The statements about regular trespassing on-site and the distinction of site personnel is confusing. The Site is not fully secured, and EPA assumes that the trespassers can easily enter the 4A and 4B areas without drawing the attention of on-site personnel. Future trespass may be totally unrestricted. If the trespass scenario does not allow for on-site trespass under these conditions, then this scenario needs to be expanded.

Response:

The trespass scenario will be modified in response to EPA comments, as discussed in response to Comment 29a. Noncarcinogenic exposure will be averaged over the exposure period (i.e., either 3 months or 7 months, depending on the scenario), and compared to subchronic toxicity criteria. At EPA's request, the fraction ingested (FI) term for soil will be increased from 0.75 to 1.0. This is consistent with assuming that trespassing occurs only during the spring and summer months, as discussed in response to Comment 29a.

In response to EPA's comment, the trespasser scenario will consider different assumptions for current and future trespassing, as discussed in response to Comment 29a. The current scenario will assume less frequent trespassing in Areas 1, 2, and 3 due to the presence of perimeter fencing and the active ACS facility. The hypothetical future scenario will consider a greater frequency of trespassing.

b) Page 3-34, Second Bullet, Frequency of Dermal Contact

See comment on the frequency of the incidental ingestion above.

Response:

See response to Comment 30a.

c) Page 3-34, Third Bullet, Frequency of Inhalation

See above comments on exposure frequency for standard trespass scenario.

Response:

See response to Comment 30a.

d) Page 3-34, First paragraph

EPA notes that the draft BRA used a prorated inhalation rate, without considering the receptor activity. EPA notes that extreme detail is provided to support factors which reduce the exposure. However, when the exposure may be increased by such an effort, ballpark values are used rather than providing detail. It is reasonable to assume that the inhalation rate would be greater for someone walking, hiking or performing some activity during the trespass than during the sleeping hours. Inhalation rates are available for different activity patterns. EPA requires that more appropriate inhalation rates be used for the trespasser.

Response:

See response to Comment 23c.

e) Page 3-35, Frequency of ingestion of Surface Water

Exposure frequency for this pathway should be adjusted as described above.

Response:

See response to Comment 30a.

f) Page 3-35, Frequency of Contact with Surface Water

See above comment.

Response:

See response to Comment 30a.

31. Comment: Section 3.4.7.3; Exposure Duration/Trespasser:

As is stated above, it is not clear from the text who the receptor is in this exposure scenario. It appears that an assumption is made that trespassing is always observed and stopped in areas 4A and 4B at present, and that trespassing on-site will always be stopped in the future. These statements are either inappropriate for the scenarios under consideration, or the trespass scenario needs to be expanded.

Response:

The reason for the confusion is unclear. In the preliminary draft BRA, regular trespassing of the site is assumed under both current and future scenarios. A longer duration (10 years) is assumed under the high-end scenario, under both current and future conditions, while a shorter exposure duration (2 years) is assumed under a typical scenario for both current and future conditions. As discussed in response to Comment 29a, in response to EPA comments, the revised BRA will distinguish between current and future trespasser scenarios, by assuming that more frequent trespassing could occur in the future if conditions change at the site.

32. Comment: Section 3.4.7.1; Contact Rates/Residential:

a) Page 3-36, Second Bullet, Dermal Contact with Sediments

As previously discussed, EPA does not know why the 95% UCL adherence factor for the reed gatherers was used or how this value was derived. Additionally, it is not clear how the geometric mean adherence factor was determined, and why the geometric mean was used instead of an arithmetic mean. Unless adequate documentation is provided to support these assumptions in the dermal scenario, then they are not to be used in the BRA. See also the above comments on this issue.

Response:

At EPA's request, the EPA default adherence factors of 0.2 and 1.0 mg/cm^2-event will be included in the RME and CT scenarios, respectively. See response to Comment 20c.

b) Page 3-37; Incidental Ingestion of Groundwater

It is not clear how the child's exposure is going to be assessed. It is typical to assume that this water is used to fill a swimming or wading pool. Incidental ingestion is likely in a swimming activity, and guidelines are available in the Dermal guidance for the number of days and hours spent swimming. New EPA guidance specifies that the child exposure must be evaluated in the assessment, and this is a reasonable scenario.

Response:

As shown in Tables 3-5 and 3-6 of the preliminary draft BRA, and discussed on page 3-37, residents (both children and adults) are assumed to ingest 0.05 liters of water per day under both high-end and typical lawn watering scenarios. At EPA's request, as discussed in response to Comment 16, an additional scenario considering a child swimming/wading in a pool filled with water from the upper aquifer will also be included in the BRA.

c) Page 3-38, Dermal Contact with Groundwater

A child under the age of 6 watering the lawn for an hour is a very unlikely scenario. EPA suggests that the swimming pool/wading pool exposure be evaluated as suggested above. In addition, dermal absorption of VOCs during the lawn-watering exposure is not likely due to volatilization.

Response:

The scenario considered in the preliminary draft BRA did not assume a child under the age of six watering the lawn for an hour; the scenario instead involved exposures of a child who might be present as an adult waters the lawn. It was conservatively assumed that the child would be exposed to the water under such a scenario through both dermal contact and ingestion. At EPA's request, an additional scenario involving a swimming/wading pool filled with ground water from the upper aquifer will also be included in the BRA. See response to Comment 16.

d) Page 3-38, Dermal Contact While Showering

The child 12 minute showering scenario is not supported by most toxicologists. Small children usually take baths; these are usually of longer duration (on the order of 20-30 minutes). The child bathing scenario must replace the child showering scenario.

Response:

At EPA's request, the showering scenario will be replaced by a bathing scenario for children. Based on data from EPA's 1996 draft Exposure Factors Handbook, the RME bathing scenario for a child will assume five baths per week for a duration of 45 minutes per bath. The CT scenario for a child bathing will assume three baths per week, each with a duration of 20 minutes.

e) Same as above

Please see the prior comments on the derivation of permeability coefficients.

Response:

See response to Comment 22g.

33. Comment: Section 3.4.8.2; Exposure Frequency/Residential:

a) Page 3-40, Frequency of Inhalation of Vapors

Elaborate upon the residential excavation activities referred to here.

Response:

The text will be modified to clarify that this section addresses off-site residential exposures to vapors emitted during on-site excavation activities.

b) Page 3-41, Frequency of Ingestion of Groundwater

A typical swimming scenario should be used for the child exposure scenario. See above comments on this issue.

Response:

A typical swimming scenario will be added to the BRA at EPA's request; see response to Comment 16.

c) Page 3-41, Frequency of Dermal Contact with Groundwater

See above comments on appropriate outdoor groundwater exposure scenarios for children under the age of 6.

Response:

See response to Comment 16.

34. Comment: Section 3.4.8.5, Averaging Times/Residential:

a) General Comment

When short-term exposures are evaluated, the averaging time is more correctly related to the actual time periods times the number of times the exposure occurs, than to an averaging time that uses a 365 days/year when the exposure occurs over a shorter number of days or weeks. As previously stated, this averaging time correction needs to be applied throughout the BRA.

Response:

As agreed during the February 23, 1998 meeting, an averaging time of 365 days per year will be used in evaluating chronic exposures. For exposures which occur for only a portion of the year, exposure will be averaged over the duration of the exposure. As previously discussed, exposures of 10 days or less will be considered acute, while exposure scenarios with averaging times between 10 days and one year will be considered subchronic in the BRA.

35. **Comment: Section 4.1; U.S. EPA Toxicity Values:**

    a) **Second paragraph, 3rd sentence**

    Remove the term "actual" risk, since it is not clear what is meant by the term here. The true or actual risk would depend on the combination of input values used in the calculation. While the range of probabilities would theoretically include a value as low as zero, the likelihood of the average or upper-bound risks being as extreme as zero is unlikely!

    Response:

    At EPA's request, the term "actual" will be deleted from the third sentence in the second paragraph of Section 4.1.

36. **Comment: Section 4.2; Constituents Without EPA Toxicity Values:**

    a) **Chromium (Total)**

    The text indicates that the toxicity values for trivalent chromium are used for total chromium in the draft BRA. Actually, EPA recommends the use of the 1:7 mixture ratio for Cr (VI) and CR (III), as indicated in IRIS, to determine the fraction of chromium VI in the total and the application of the chromium VI slope factor to this portion of the total chromium. The methodology employed in the draft BRA is likely to underestimate the risk from this contaminant. Of course, speciation data eliminates the need for such a generalized approach.

    Response:

    As requested by EPA, the BRA will assume the same Cr VI to Cr III ratio indicated in IRIS.

37. **Comment: Section 4.2.2.1; Child Lead Exposures:**

    a) **Page 4-3, last sentence**

    Current and future exposures" should be "Current and future land use exposures.

Response:

The text will be clarified consistent with the EPA comment.

38. Comment: Section 4.2.2.2; Adult Lead Exposures:

a) Equations 4, 5 and 6, pages 4-4 to 4-6

While the equations outlined in the text not incorrect, they do not allow a meaningful estimation of risk in the population of concern, the fetus of a woman of child-bearing age. If the risk calculation is to be done, the equations from the Adult Interim Methodology should be rearranged in a manner to allow calculation of the probability that the fetal blood lead level will exceed the level of concern (10 ug/dL). This endpoint is consistent with the endpoint in the IEUBK Model. This calculation is easily done using the equations in the Methodology. More detailed instructions are included here to aid the PRP group in this calculation. The endpoint derived by ENVIRON - the 95th percentile blood lead level for the fetal population - is not readily compared to any meaningful endpoint, and thus should not be used in the BRA.

Response:

The methodology followed in the preliminary draft BRA is identical to the one presented in EPA (1996) guidance. At EPA's request, however, the results will be rearranged as requested in the comment.

b) Page 4-6, 2nd paragraph, last sentence

It is unlikely that anyone can say that women of child-bearing age will never be employed in a facility on the ACS site. Because no industry can discriminate in hiring based on sex, female workers remain a real and likely possibility at the ACS site, and even more likely at a future development on the property. For this reason, this statement appears to present a rather feeble and inane argument, and the sentence should be deleted.

Response:

The text in the preliminary draft BRA does <u>not</u> state that women of child-bearing age will never be employed in a facility on the ACS site, as implied by EPA's comment. The text in the preliminary draft BRA reads as follows: "Since the majority of the workforce at the ACS site is male, it is unlikely that females of child-bearing age will form a significant portion of the workforce at the ACS site." At EPA's request, this statement will be deleted from the BRA. It should be emphasized that the preliminary draft BRA <u>did evaluate</u> women of child-bearing age under both current and future routine workers scenarios.

c) Page 4-6, 3rd paragraph

The trespasser exposure frequency is discussed in Section 3.4.7.2, not 3.4.3.2 as stated. This trespass scenario and the reason for not including lead exposure estimates for the trespass scenario are inconsistent with Region 5 recommendations. Region 5 considers the adolescent trespass scenario to be as follows: 1 day/week in April, May, Sept. and Oct. (or 18 days) plus 3 days/week in June, July and Aug. (or 36 days) for a total of 54 days which occur over a period of 7 months. In addition, the RME exposure is considered to be 4 hours/day, while the CT exposure is 2 hours/day. Under these conditions, lead exposure can, and usually is, evaluated for the trespass exposure. The Adult Interim Methodology is reasonable for the Region 5 scenario.

Response:

The typographical error identified by EPA will be corrected. At EPA's request, lead modeling for the trespasser scenario will be included in the BRA. The exposure assumptions for the trespasser scenario are discussed in response to EPA Comment 29a.

d) Same as above

The excavation worker exposure frequency is discussed in section 3.4.6.2, not 3.4.2.2 as stated. While EPA does not expect the Adult Interim Methodology to be used to evaluate such a scenario, a longer excavation scenario, as might occur during any construction activities at the site, must be evaluated using this methodology.

Response:

The typographical error identified by EPA will be corrected. As requested by EPA, lead modeling will be included for the construction scenarios described in response to Comment 12b.

e) Page 4-7. First Bullet.

EPA would caution against deriving separate baseline blood lead values either for a combination of white female and male workers in the Midwest or from data on female workers of child-bearing age, from the NHANES III data. Because of the non-representative sampling and small numbers for some sub-group, Brody used a very sophisticated weighing scheme in her analysis to derive estimates for the population. While the value derived in the BRA for the baseline blood level input (1.75 ug/dL versus the default value of 1.7 ug/dL), are not unreasonable, extrapolation to other subsets might lead to grossly erroneous results. All such extrapolations are discouraged by EPA. Input value should only be adjusted when there is site-specific data to support an alternate

Response:

At EPA's request, the baseline blood level used in the BRA will be reduced from 1.75 μg/dL to 1.7 μg/dL.

f) Page 4-7, last bullet

EPA interprets this to mean that an exposure frequency of 170 days/year is assumed for outdoor exposure to routine workers and the balance of the 237 days is assumed to occur as indoor exposure. (Note that the 250 days/year is based on actual U.S. Department of Labor data for the full time worker population, so it is not clear why this adjustment is necessary.) Given the lack of additional data, it should also be assumed that the outdoor soil lead concentration and the indoor dust lead concentration are equal (the usual assumption in an industrial setting). The value for the soil to dust transfer coefficient of 0.70 quoted here actually applies to the residential scenario, not the industrial scenario. Routine vacuuming is not expected to take place at the industrial site, and there is NO data to support a lower indoor lead concentration at this site. EPA does not accept the values derived in the draft BRA for this parameter.

Response:

See response to Comment 23a. At EPA's request, a soil-to-dust transfer coefficient of 1.0 will be conservatively assumed for the industrial scenario.

g) Page 4-9, Ingestion Rate

The EPA default ingestion rate of soil and indoor dust is 50 mg/day for the average worker in a non-contact intensive soil exposure scenario (no outdoor exposure). When outdoor exposure is expected, a reasonable average ingestion rate is 100 mg/day, except in more contact intensive activities such as digging, where an ingestion rate of 480 mg/day is more appropriate. EPA did not see any justification for adjusting the default ingestion rate for the routine worker at this site, and therefore, does not find the value of 25 mg/day acceptable. (Note that the EPA methodology uses the 1993 reference for the ingestion rate, while the PRP group uses the 1991 document).

Response:

Consistent with EPA's comment, the EPA default ingestion rate of 50 mg/day will be used for both the RME and CT scenarios.

h) Page 4-9, last bullet. GSD

A stated above, EPA does not support the recalculation of the GSD from the NHANES data. The derived value of 1.87 is higher than the default value of 1.8 for a more homogeneous population, and reflects more variability in the worker population. (Note that Brody derived a value of 1.89 for the entire national white female work population of

child-bearing age). Such a value may be overly conservative for the Griffith, Indiana workforce.

Response:

At EPA's request, the default GSD value of 1.8 will be used instead of the derived GSD of 1.87 in the BRA.

39. Comment: Section 5.0; Risk Characterization:

a) Page 5-1, Last paragraph

The last sentence, which begins "According to U.S. EPA..." and the sentence that follows on page 5-2 pertains to EPA guidance for remedy selection, not to risk management. The BRA is to be an unbiased evaluation of risk at the site. It is not appropriate use risk management principles in the risk assessment. These types of statements are more appropriate during the remedy selection process.

Response:

Consistent with EPA guidance regarding risk characterization, the risk estimates in the preliminary draft BRA were compared with regulatory benchmarks to provide a context for the reader. At EPA's request, however, the sentence indicated by EPA in its comment will be deleted. Instead, the concept of a cancer risk probability will be clarified (e.g., "a 1 in 10,000 cancer risk indicates that an exposed individual is estimated to have an incremental risk of developing cancer of approximately 1 in 10,000 over a lifetime, as a result of the specific exposure"). The background cancer risk in the U.S. will also be presented in order to place the predicted incremental cancer risk values into context, as required by current EPA guidance.

40. Comment: Section 5.2; Blood Lead Levels:

a) Page 5-6, Section 5.2.1, Bullet

The air concentration of 0.0003 up/me used here is suspect. This level is several orders of magnitude lower than measured ambient levels. If real data is not available for the Griffith area, the Model default concentrations or the State ambient air concentration should be used. The value is not reasonable, and thus not acceptable to EPA.

Response:

The text will be clarified to emphasize that the default lead concentration in air (0.1 $\mu g/m^3$) was used in all blood lead modeling, if the air concentration for lead associated with the site was predicted to be lower than this default value.

As discussed in response to Comment 19b, predicted air concentrations will be compared to actual site monitoring results in the draft BRA, as agreed during the February 23, 1998 meeting.

b) Page 5-6, above

The modeled site air lead concentration several orders of magnitude below the usual ambient level raises concerns about the reasonableness and accuracy of off-site air concentrations used for other contaminants as well. The modeling results should be included in a table; these concentrations should be compared with normal ambient levels where data permit. Some air monitoring should be considered for this Site.

Response:

See response to Comment 40a.

c) Page 5-7, first paragraph

The air lead concentration of 0.0004 up/me is several orders of magnitude lower than the lowest ambient levels monitored nationally. See above comments on this issue.

Response:

See response to Comment 40a.

d) Page 5-7, Bullets

These statements would appear to refer to some sort of average drinking water lead concentrations. The data show that the aquifers are not homogeneous, and private well lead concentrations range to 41.7 ug/L, which is well above EPA's action level (15 ug/L). Other Area 5 wells show high concentrations as well. The data must be provided and the specific wells indicated from which the data was used for the Area A and Area B assessments. U.S. EPA guidance prohibits the averaging of contaminant concentrations across aquifers.

Response:

The lead concentration in ground water cited in the EPA comment (41.7 μg/L) is from a private industrial well which is no longer in service. Lead concentrations are below 15 μg/L in all off-site monitoring wells, in both the upper and lower aquifers.

With regard to the ground water data to be used in estimating current and future exposures to lead, the BRA will be modified as indicated in response to EPA Comment 18.

41. Comment: Section 5.2.2; Adult Blood Lead Levels:

a) Sections 5.2.2.1 and 5.2.2.2

The calculations for adult exposure in these sections are incorrect, as previously discussed. See the prior comments on the use of the Adult Lead Methodology in the draft BRA. The PRP group should work with EPA to correct these calculations.

Response:

The Committee does not agree that the calculation for adult exposure to lead is "incorrect." However, presentation of the results will be modified as indicated in response to Comment 38a, and the input assumptions will also be modified as indicated in other responses to EPA comments.

42. Comment: Section 5.3; Uncertainty:

a) General Comment

The site characterization should include discussions of conditions which could result in underestimation of risk as well as overestimation of risk. The text does not present a very balanced or objective discussion of uncertainty in the Uncertainty Analysis Section. The following sections present some conditions under which may result in underestimations. These need to be included in these uncertainty sections.

Response:

The discussion of uncertainty will be expanded, as indicated in response to Comments 43 through 48 below.

43. Comment: Section 5.3.1; Uncertainty/Site Characterization:

a) Underestimation due to hot spot exposure

The averaging of contaminant "hot spot" concentrations with contaminant concentrations from non-contaminated areas is statistical dilution, and causes underestimation of site contaminant Levels. The exposure activity patterns of the receptor populations (under the present land use and the future land use) cannot be known. Biased exposures can and do occur because of non-random activity patterns, and these can result in exposure to hot spot areas.

Response:

See response to Comment 17. The discussion of uncertainty with respect to site characterization will be expanded, at EPA's request.

b) Underestimation due to incomplete sampling

While site sampling was focussed to identify the areas and extent of contamination, it cannot be known whether the maximum contaminant concentrations on the site have been detected. This is especially true when sampling was not conducted in a manner to eliminate such concerns. In cases where on-site contaminant levels may exceed the maximum detected concentrations, the risk will be estimated. The likelihood of such a problem at this Site cannot be eliminated, given the sample collection methods.

Response:

At EPA's request, the discussion of uncertainty and site characterization will be expanded. It will be acknowledged in the BRA that it is impossible to guarantee that highest concentration at a site will be detected during any sampling event. However, targeted sampling conducted at the ACS site tends to provide conservative estimate of average concentrations, and use of the 95th UCL on the mean to estimate exposure concentrations based on the largely biased sampling events provides an even greater assurance that the average concentration used in evaluating chronic exposures is not underestimated.

c) Underestimation due to toxic decay products

Site contaminants may decay to more toxic chemicals. This is particularly true of the type of chlorinated solvents found on this site.

Response:

At EPA's request, the discussion of uncertainty with regard to site characterization will be expanded. Site contaminants may degrade to more or less toxic chemicals. It will be emphasized that sampling and analysis was performed at the ACS site for common degradation products, such as vinyl chloride from chlorinated solvents.

44. Comment: Section 5.3.2, Tentatively Identified Compounds (TICs):

a) Page 5-15. last paragraph

The effect of the TICs on the final risk estimate is not presented. The text indicates that they are not "significant". This assumption is not properly supported or supportable. The risk due to the TICs should be clearly shown. The presence of "600 unique contaminants" whose toxicity or interaction can only be guessed at, would seem to be verification of the gross contamination at the site and should raise the level of concern for any thinking person. EPA believes that the presence of all these chemicals clearly increases the

uncertainty in the BRA, even though their overall health impact cannot be truly know. The section on TICs needs a balanced discussion.

Response:

At EPA's request, and as agreed during the February 23, 1998 meeting, this section will be expanded to provide an estimate of the percentage of risk that is associated with the 13 TICs with EPA toxicity criteria. It will also be further emphasized in the Uncertainty Section that there are toxicity criteria for only 13 of the approximately 600 TICs identified at the Site.

45. Comment: Section 5.3.3, Exposure and Behavioral Patterns:

a) Assumptions

U.S. EPA does not agree with the statements in this section. EPA does not believe that the mixing ratio of surface and subsurface soils can be know, especially over time, and recommends the use of clearly labeled bounding estimates.

EPA does not believe that protective equipment will always be used by excavation workers. Future excavations workers, and especially future construction workers, are more likely not to wear such equipment. Even when protective clothing is worn, it is often removed during smoking breaks or lunch. Contaminated clothing can be worn more than once and present a continuing source of exposure.

Onsite ground water was available until recently, was used in the past; in fact, not all the production wells have yet been abandoned. It is also foreseeable that ground water may be used again in the future if the demand for water cannot be met. Onsite groundwater could be used for non-potable purposes, such as showering or it could be used in some future site facility, such as a car wash. The Site BRA should seek to identify whether exposures could result in risk, and support the need for restrictions against the installation of on-site wells.

Response:

The uncertainty with respect to exposure scenarios and behavioral patterns will be expanded, at the request of EPA.

As indicated in response to EPA Comment 11a, a bounding estimate of risk based on assuming the subsurface soil will be included in the BRA.

EPA's basis for assuming that future excavation workers at the site are more likely not to wear protective equipment is not clear. However, to provide a conservative evaluation of future risk, the future scenario in the preliminary draft BRA assumed no protective equipment in the excavation scenario; this conservative assumption will continue to be used in the revised BRA.

Contrary to the EPA comment, all on-site production wells <u>have</u> been abandoned. Furthermore, the preliminary draft BRA <u>did</u> include future scenarios involving use of on-site ground water, under the routine landscaper scenario previously recommended by EPA in its October 1, 1997 comments on the conceptual site model. As requested by EPA

during the February 23, 1998 meeting, the hypothetical on-site future ground water use scenario will be expanded to also include use of lower aquifer ground water in an on-site shower scenario.

46. Comment: Section 5.3.4; Uncertainty/Dermal Soil Loading:

a) Underestimations

EPA notes that the discussion does not include that Kissel's grounds keepers wore gloves, that the different work populations were evaluated after very short exposure periods in some cases, that the data sets were extremely small (2 workers in some cases), that no distributions or statistical percentile data can be applied to these data, that the Exposure Factors Handbook indicates the confidence in this data is low, that Kissel suggests that much of the data is not appropriate for use in this manner, and so on. Instead, the PRP group insists that this data provides overestimates of the dermal pathways. U.S. EPA insists that some balance be added to these discussions.

Response:

At EPA's request, the uncertainty regarding dermal soil loading will be expanded. Furthermore, as indicated in response to Comment 22c, the default dermal adherence values requested by EPA will also be included in the BRA.

It should be emphasized that while EPA's 1996 draft Exposure Factors Handbook indicates that confidence in the Kissel et al. (1996) data is "low," it also identified the Kissel et al. (1996) investigation as the "key study." The 1996 EPA Exposure Factors Handbook places lower reliance on the studies used by EPA in its 1992 Dermal Exposure document; EPA indicates that the confidence in the data from these studies, which the comment suggests that the BRA rely on, is also "low."

47. Comment: Section 5.3.7; Uncertainty/Chromium:

a) Underestimations

The discussion that the chromium detected at the Site is pure conjecture, is not supported by real data, and there is no basis to believe that EPA's 6:1 ratio would be conservative. EPA notes that this was been a recycling plant site for a long period of time, and anything may have been included in the materials received. The fact is that only total chromium was analyzed for at the Site; no speciation analyses were conducted. The construction scenario, which is missing from the draft BRA, would provide better bounding results than those stated.

Response:

The section of uncertainty regarding chromium will be deleted. Instead, as indicated in response to Comment 36, the IRIS ratio for Cr VI to Cr III will be used throughout the BRA as requested by EPA.

48. Comment: Section 5.3.5; Uncertainty/Cumulative Risks:

a) Underestimations

The cumulative risk assume no synergistic or antagonistic interactions. However, it is more reasonable to assume that some synergistic effects, due to mixtures of contaminants, will occur, given the wide range of chemicals at the site. It is more likely that the effects of the interactions of mixtures will result in serious underestimates of risk at this site, than that the risk of these mixtures has been overestimated.

The text discusses the overestimation due to the inclusion of class C carcinogens, but the contribution to the risk estimates by these contaminants is not stated. It is more likely that the inclusion of class C carcinogens has had little effect on the risk estimates. Data should be provided to support this discussion.

Response:

The uncertainty section regarding cumulative risks will be expanded as requested by EPA.

EPA does not provide a basis for its comment that "it more likely that the effects of the interactions of mixture will result in serious underestimates of risk at this site, than that the risk of these mixtures has been overestimated." In most cases, there is no way to determine whether or not synergistic or antagonistic interactions will result in an underestimate or overestimate of risk.

At EPA's request, the percentage of risk associated with Class C carcinogens will be expanded in this section.

49. Comment: Tables 2-1, Summary of Constituents in Soil Evaluated in the Rick Assessment:

a) **General Comment:** *Samples labeled TP are subsurface soil samples collected from test pits excavated during the 1989/1990 Remedial Investigation. It appears that TP samples were composited, including VOC analysis. TP samples appear to have been collected to characterize the buried waste as opposed to characterizing the subsurface soil.*

Response:

No response required.

b) **General Comment:** *The table contains results of test pit and soil boring samples with very high concentrations (essentially pure product) collected in Areas 1 and 2 as*

well as samples collected outside these areas with much lower concentrations. Some organic compounds detected in the Area 1 and 2 samples were so high that the laboratory had to dilute these samples by over a factor of 1 million in order for the instrument to work. These corresponding high detection limits will dilute out compounds that are not as high as others. This is why there is a wide range of minimum and maximum detection limits.

Response:

No response required.

c) **General Comment.** *There are numerous samples with much higher concentrations of compounds that were not included in the table because the samples were collected at depths greater than 10 feet below ground surface. The highest concentrations of contaminants are found as deep as 15 to 17 feet below ground surface. This issue was discussed in the text of the report.*

Response:

No response required.

d) **General Comment.** *The table includes surface soil samples labeled SA that were collected during the 1989/1990 Remedial Investigation from three designated Soil Areas (SA01 and SA02 were collected from Area 3 and SA03 was collected from Area 1). SA samples were composite samples except the VOC samples, which were discrete non-composited samples. SA samples were collected at a depth of 3 feet below ground surface.*

Response:

As described in the Remedial Investigation report (Warzyn 1991, p. 3-3), SA samples "were composite samples from 6 to 18 inch depths at five discrete locations across an approximately 50 by 100 foot area." Thus, SA samples were collected within 0-2 ft of the surface and are appropriately evaluated as surface soil samples in the BRA.

e) **General Comment.** *Explain why the results from SA03 are not used in the Risk Assessment for surface soil in Area 1.*

Response:

As agreed to previously with EPA, the October 1997 draft of the Risk Assessment did not include evaluation of exposure to surface soil in Area 1, pending receipt of the September 1997 sampling results. Results from SA03 will be included with the 9/97 data for surface soil in Area 1.

f) **General Comment.** *Numerous TP samples were collected a depth of 3 feet, below ground surface; however, the TP samples are input into the table as subsurface samples rather than surface samples. Explain why SA samples collected at 3 feet below ground surface are surface samples but TP samples collected at the same depth are not.*

Response:

SA samples were collected within 2 feet of ground surface (see response to 49d) and appropriately evaluated as surface samples. TP samples were collected from 3 to 9 feet below ground surface and appropriately evaluated as subsurface samples.

g) **Page 1 of 7, Area 1, SUB, VOC**

1,2-dichloropropane maximum detected value should be 7.5 mg/kg.

Response:

The value reported in the preliminary draft BRA (75 mg/kg) is consistent with the electronic files provided for compilation into the database, but appears to be a transcription error from the original laboratory results for sample ACS-SB70-08, collected during the RI. Following correction of this error, the 1,2-dichloropropane maximum detected value should be 22 mg/kg from ACS-TP03-09.

h) **Page 1 of 7, Area 1, SUB, VOC**

Carbon tetrachloride maximum detected value (3,600 mg/kg in TP07-03) was left off the table.

Response:

This chemical was not listed in the preliminary draft BRA because it was detected in less than 5% of the subsurface soil samples in Area 1. All detected chemicals will be reported in Tables 2-1 through 2-4. (See response to Comment 8.)

i) **Page 3 of 7, Area 2, SUB, VOC**

Methylene chloride maximum detected value should be 6.8 mg/kg.

Response:

The value reported in the preliminary draft BRA (68 mg/kg) is consistent with the electronic files provided for compilation into the database, but appears to be a transcription error from the original laboratory results for sample ACS-SB40-10. Following correction of this error, the methylene chloride maximum detected value should be 6.8 mg/kg as noted..

j) **Page 5 of 7, Area 3, SURF, INORG**

Thallium maximum detected value should be 1.2 mg/kg was reported as U undetected in the Remedial Investigation report.

Response:

The database and BRA will be modified according to the EPA comment.

50. **Comment: Table 2-2, Summary of Constituents in Sediment Evaluated in the Risk Assessment:**

a) **General Comment.** *Explain where the maximum detection limits are reported.*

Response:

Maximum detection limits for all nondetects are reported in Table 2-2. Detection limits for detected results have not been reported previously and are not currently available in electronic format. Montgomery Watson has the hard copies of the original laboratory reports with this information.

b) **General Comment.** *Explain why Areas 4A and 4B and Areas 5 and 6 are included together in this table. The surface water data collected from Areas 4A and 4B were segregated.*

Response:

At EPA's request, sediment data will be segregated by individual exposure area.

c) **General Comment.** *The results of samples SD37 and SD38 were not included in the table. These samples should be used to evaluate either Area 4A or 5. Explain why they were not used in the Risk Assessment or include them.*

Response:

The inorganics analytical results of SD37 and SD38 were included in Table 2-2 and the preliminary draft BRA. The organics analytical results for these samples were inadvertently omitted from the database, and will be added to both the database and revised draft BRA.

d) **General Comment.** *Sample SD05 was collected in Area 2; however, it is assigned to Areas 5&6 in the table. Explain why.*

Response:

Sample SD05 was collected outside the boundaries of Area 2 defined in the preliminary draft BRA. At EPA's request, the boundary will be shifted to include SD05.

e) **General Comment.** *Explain why Areas 4A and 4B and Areas 5 and 6 are included together in this table. The surface water data collected from Areas 4A and 4B were segregated.*

Response:

See response to comment 50b.

f) **Page 1 of 3, Area 4A & B, SVOC**

2,2'-oxybis(l-chloropropane) maximum detected value (1 mg/kg in SD37) and SVOC diethylphthalate maximum detected value (1.9 mg/kg in SD38) were omitted from the table.

Response:

Organics data for samples SD37 and SD38 were not included in the electronic files provided for compilation into the database. These data will be added to the database and BRA.

g) **Page 1 of 3, Area 4A & B, VOC**

1,2-dichloroethene maximum detected value (0.012 mg/kg) was detected in sample SD30 not SD26.

Response:

The database and BRA will be modified according to EPA's comment.

h) **Page 1 of 3, Area 4A & B, VOC**

2-butanone maximum detected value was detected in sample SD33 (0.074 mg/kg) not SD20.

Response:

2-butanone was not detected in the original analysis of SD33 (detection limit at 0.056 mg/kg) but was detected in a reextract of SD33 (0.074 mg/kg). For other samples and/or other chemicals, reextracted concentrations were lower than indicated in the original analysis. Data based on reextraction will be evaluated in greater detail, and discussed with EPA.

i) **Page 1 of 3, Area 4A & B, SVOC**

The results of SD22, which contained a total SVOC concentration of 14,990 mg/kg, were averaged with SD22 duplicate, which had much lower concentrations (total SVOC concentration of 2,626 mg/kg. The relative percent difference between SD22 and the SD22 duplicate is 140%, which brings to question the precision of the sampling procedure. The effect of SD22 is reduced because it has been averaged with the duplicate. Explain why an average was used for SD22.

Response:

SD22-01 and SD22-91 were field duplicates. Consistent with the approach throughout the BRA, valid results (i.e., without an R qualifier) for duplicates were averaged to estimate the concentration at a location. There is no basis for assuming the results for SD22-01 are more valid than for SD22-91, or vice versa. The sampling techniques were EPA-approved and overseen by EPA.

j) **Areas 1 and 2**

Other sediment samples were collected in Areas 1 and 2. Explain why they were not included in the table.

Response:

At EPA's request, sediment samples for Areas 1 and 2 will be added to the table.

51. **Comment: Tables 2-3, Summary of Constituents in Ground Water Evaluated in the Risk Assessment:**

a) **Page 1 of 4, Area 1, Upper, INORG**

Manganese maximum detected value (3.89 mg/L in ACS-GWMW04-19941230) and PCB Aroclor 1248 maximum detected value (0.0026 mg/L in ACS-GWMW04-19890803) were omitted from the table.

Response:

Manganese was inadvertently omitted from the table and will be added with a maximum concentration of 4.25 mg/L (in ACS-GWMW04-01-1989 0803). Aroclor 1248 was not included because it was detected in less than 5% of samples from the upper aquifer. It will be added to the table. (See response to Comment 8.)

b) **Page 2 of 4, Area 4A, Upper, SVOC**

Isophorone was not detected in sample 97ZB04S08.

Response:

The database and BRA will be modified according to the EPA comment.

c) **Pages 3 and 4**

Explain why there are blanks for the minimum and maximum detected values for several samples.

Response:

At EPA's request, minimum and maximum detected values will be included for all detected chemicals.

d) **Page 3 of 4, Area 5, Upper, SVOC**

2,2'-oxybis(1-chloropropane) was not detected in sample 97ZB04S05.

Response:

The database and BRA will be modified according to the EPA comment.

52. **Comment: Tables 2-4, Summary of Constituents in Surface Water Evaluated in the Risk Assessment:**

a) **General Comment.** *The columns showing the minimum and maximum detected values are transposed. The columns showing the minimum and maximum detection limit for non-detects are also transposed.*

Response:

The transposed columns will be corrected.

b) **General Comment.** *Surface water samples were collected during the 1989/1990 Remedial Investigation from other Areas. Explain why these samples were not evaluated during the Risk Assessment.*

Response:

Limited surface water data were collected from Area 1 (2 samples), Griffith Landfill/Area 2 (1 sample), and Area 5 (2 samples). At EPA's request, the results from these samples will be added to the database.

c) **General Comment.** *Explain why Areas 4A and 4B sediment data were included together, but the surface water data collected from Areas 4A and 4B were segregated.*

Response:

Sediment data were not included in Table 2-4, but consistent with EPA's request will be segregated by Area in Table 2-2.

d) **General Comment.** *Sample 97ZB04821 should be referred to as 97ZB04S21.*

Response:

The sample identification will be corrected in the database and BRA.

e) **Page l of 1, Area 4B, VOC**

1,3,5-trimethylbenzene maximum detected value (0.011 mg/L in 97ZB04S21) was left off the table.

Response:

Compounds detected in less than 5% of samples from a medium will be added to the table. (See response to Comment 8.)

f) **Page 1 of 1, Area 5**

Sample SW14 contained lead and zinc that were left off the table.

Response:

At EPA's request, results from surface water samples in Area 5 will be added to the table.

g) **Page 1 of l, Area 4A, VOC**

The number of benzene detections is listed as 3, which does not include the value for the duplicate of sample SW09. Explain why the duplicate was not included in the evaluation, but the duplicate for SD22 was used to evaluate the sediment data.

Response:

Duplicates were averaged prior to summarizing frequency of detection in Tables 2-1 through 2-4, and the duplicate of SW09 was included in the evaluation.

53. Comment: Table 3- 1:

This Table has been modified since the last presentation (August 22, 1997). Many pathways have been eliminated or reduced to a semi-qualitative evaluation. The reason for the changes is not given. EPA finds this unacceptable. These pathways were discussed at length during meetings.

Response:

The only changes made in the August 22, 1997 version of the conceptual site model (CSM) table were in response to EPA's October 1, 1997 comments, or to reflect text in the CSM that had already been accepted by EPA. It is assumed that there are no EPA comments on Table 3-1 that have not already been identified in EPA's other February 10, 1998 comments on the preliminary draft BRA.

54. Comment: Tables 3-5 and 3-6:

The tables do not specify what values apply to the current land use (restricted activities) or when they apply to the future land use (unrestricted activities). Both land uses are to be evaluated. The construction scenario is missing. The parameter intake values are inconsistent with EPA guidance, Region 5 guidance or simply in error in many cases (above discussions). They need to be revised. Averaging times for non-carcinogens are most often incorrect.

Response:

The values in Table 3-5 and 3-6 apply to both current and hypothetical future use, unless otherwise indicated. The tables will be clarified to emphasize the distinctions between current and future land use, however. With regard to the specific issues raised in this comment, please see responses to the previous EPA comments.

55. Comment: Table 4-1; Incorrect Toxicity Values:

The oral RfD for 1,1,1-Trichloroethane should be 2.0E-02 instead of 3.5E-02. The oral RfD for Copper should be 3.5E+00 instead of 4.0E-02.

Response:

The toxicity criteria used in the preliminary draft BRA for 1,1,1-trichloroethane (TCA) and copper were taken from the USEPA Region III risk-based concentration table and the 1995 EPA Health Effects Assessment Summary Tables (HEAST), respectively. Written documentation of these values was provided to EPA during our February 23, 1998 meeting. In its comment, EPA does not provide references for the alternative toxicity values it recommends for either TCA or copper. The references provided by Black & Veatch during the subsequent March 2 conference call for the alternative toxicity values will be considered in the BRA (i.e., October 22, 1997 version of the USEPA Region III

risk-based concentration table for 1,1,1-trichloroethane and 1997 HEAST Update for copper).

56. Comment: Tables 5-la, 5-lb, 5-2a, 5-2b:

Most of above comments apply. In addition, many estimates are marked NA or are listed as zero. The future construction worker scenarios are missing. Area a and %B appears to have been evaluated as one area.

Risks from future ingestion, dermal contact and inhalation of site water indoors are missing.

Response:

Table 5-1a, 5-1b, 5-2a, and 5-2b will be modified as appropriate to reflect responses to previous EPA comments.

As requested by EPA during the February 23, 1998 meeting, showering using lower aquifer ground water and production well data will be added as a hypothetical future exposure scenario for on-site workers.

02-5543A:WP\6584_1.WPD

RESPONSE TO ENCLOSURE 2, U.S. EPA COMMENTS ON THE JUNE 24, 1997 ENVIRON REPORT - "REASONABLY ANTICIPATED FUTURE LAND USE AT THE ACS SITE"

1. **Comment: Page A-4; Section 2.1, Historical and Current Land Use:**

   In terms of assessing future and current land use, consideration should be given to areas where contamination has come to be located. Thus, if groundwater, surface water or the air has been or is expected to be impacted beyond the area currently defined as the Site, the impacted areas need to be included when considering current and future uses for risk assessment purposes.

   Response:

   The text will be modified consistent with the EPA comment.

2. **Comment: Page A-4; Section 2.1, Historical and Current Land Use:**

   Include the following detail in the description.

   The land use directly north of the ACS Site and south of Main Street is zoned I-2. This zoning classification is the Town of Griffith's least restrictive zone. This zoning district is designed for manufacturing, assembling, fabricating, and processing. 86-296 shows permitted used within I-2 district.

   The land directly to the North of the ACS Site and south of Main Street is zoned I-2. This area is presently occupied by an industrial park with a variety of small businesses in it, a steel bar coating-plant, a heating and plumbing contractor, scaffold storage and sales and a trucking company.

   East of Colfax and South of Main Street is zoned I-1. The I-1 zoning is a transition zoning between wholesale and manufacturing types of operations. This area now contains n industrial park that has approximately 20% of the lots sold. The Griffith Airport, a lumber planing mill and approximately 10 residences also occupy this area.

   To the northeast of the Site is Oak Ridge Prairie Park. It is owned and operated by the Lake County. It is owned and operated by the Lake County Park System as a nature preserve and activity area. Fishing, snow tubing, cross country, skiing, and hiking are some of the activities.

   East of the site is vacant land presently owned by the CSX Corp. The land is currently zoned I-2.

Southeast of the site is an area zoned I-1. This area has several businesses ranging from auto repair to machine shops. This area has approximately 15 residences. As these residences are all older homes and farms, the Town has grand fathered these residences as conforming uses in this area per 86-359.

Directly south of the site is the Town of Griffith Municipal Landfill. This site is not active as a landfill and is in the closure process.

South, southwest and west of the ACS site is zoned R-2, single family residential. Adjacent and west of ACS is vacant land presently zoned I-2.

The Town of Griffith presently uses a Master Plan developed in 1975 by Vilican-Leman & Associates. The Town of Griffith uses this at the Plan Commission level for development of land and at the Town Council level when considering zoning change requests. The master plan has set that the areas around the site are zoned as industrial areas. This area, southeast of the site also contains the largest area of vacant land in our town. The area is presently used as farms, but as the present owners are into retirement age, the future of the land is uncertain. This portion of land is presently I-2.

Attached are applicable reference materials.

Response:

The text will be modified consistent with the EPA comment.

3. **Comment: Page A-4; Section 2.1, Historical and Current Land Use:**

Regarding current residential use, the report needs to specify distances to nearest residences in number of feet and distances to zoned residential areas, including those scheduled for future development. Figure 3 should include a scale for distances. Clarify that the land immediately adjacent to the Site proper may be zoned for industrial; however, land residences do live adjacent to the Site. Stress that the area has mixed land use consisting of a combination of industrial, residential and recreational.

Response:

The text will be modified consistent with the EPA comment.

4. **Comment: Page A-4; Section 7.1, Historical and Current Land Use:**

There is no mention of the proximity to nearest schools or day care centers or other sensitive populations (elderly care centers). Proximity to these uses should be considered as well. Add this important information.

Response:

The text will be modified consistent with the EPA comment. Proximity to sensitive populations will be evaluated out to a distance of 10 miles, as agreed during the February 23, 1998 meeting.

5. **Comment: Page A-4; Section 2.1, Historical and Current Land Use:**

There should also be a discussion of whether the residents in the adjacent areas use the creeks in the immediate vicinity of the Site.

Response:

As agreed during the February 23, 1998 meeting, the text will be modified to include a discussion of the unnamed creek near Area 4A, and Turkey Creek . It will be indicated that, while no fishing, boating, or similar recreational activities occur in these creeks, wading is possible.

6. **Comment: Page A-5; Section 2.2, Zoning and Future Land Use Plans historical and Current Land Use Plans, Second Paragraph:**

Delete first sentence starting with "Thus, . . ."

Response:

The sentence will be deleted at EPA's request.

7. **Comment: Page A-5; Section 2.2, Zoning and Future Land Use Plans historical and Current Land Use Plans, Second Paragraph:**

Indicate that the development west and southwest of the site is currently in the construction stage. Indicate also, that a residential development is located east and southeast of the Site and the closest resident resides within 150 feet of the Site.

Response:

The text will be modified consistent with the EPA comment.

8. **Comment: Page A- 6; Section; 2.3, Likelihood of Future Residential Use, Suitability for Residential Development:**

Add a last sentence: "On the other hand, several factors these factors may be acceptable. In fact, some residents may find residing near Oak Ridge Prairie or wetlands as desirable.. . "

Response:

The text will be modified consistent with the EPA comment. However, the presence of the railroads and landfill, as well as a chemical plant, will be identified as detracting from the potential for development. See Comment 9.

9. **Comment: Page A-6, Section 2.3, Likelihood of Future Residential Use, Suitability of Residential Development:**

Rewrite the first statement to indicate that there are structures of features on or near the Site that may make potential residential development undesirable.

Response:

The text will be modified consistent with the EPA comment.

10. **Comment: Page A-6; Section 2.3, Likelihood of Future Residential Use, Historical and Predicted Population Trends:**

Delete the first sentence since it is not supportable.

Response:

The sentence will be deleted as EPA's request.

11. **Comment: Page A-6; Section 2.3, Likelihood of Future Residential Use, Historical and Predicted Population Trends:**

In order to get a full picture, discuss that the area south and southwest of the Site is a developing residential area.

Response:

The text will be modified consistent with the EPA comment.

12. **Comment: Page A-7; Section 2.3, Likelihood of Future Residential Use, Historical and Predicted Population Trends:**

Add the following. However, the Town Commissioner acknowledged that some residential housing is under development in the area, and the future of some of the land around the Site is unknown.

Response:

The text will be modified consistent with the EPA comment.

13. **Comment: Page A-7; Section 2.3, Likelihood of Future Residential Use, Institutional controls Currently In Place:**

Include the following language. EPA expects that institutional controls as supplements to active responses. Such institutional controls would ensure that sites cleaned up for industrial are not used for residential purposes. Include the following: These controls are generally enforced at the local level. There is no direct Federal authority to enforce institutional controls such as deed restrictions. EPA uses agreements made in legal documents such as consent decrees, and the five year review to ensure that the remedy protective where wastes remains on site above levels that levels that allow for unrestricted use. If the institutional control is not working, EPA can reconsider the remedy, as necessary to ensure protection.

Response:

The Committee is agreeable to including language to reflect the intent of EPA's above statement. Deed restrictions are already in place which prohibit residential use of the ACS Site and, as explained more fully below, those restrictions are enforceable. Statements will be added to the revised Baseline Risk Assessment that say that deed restrictions are enforced in State courts and that EPA generally uses agreements such as consent decrees or agreed orders to render deed restrictions enforceable at the Federal level. We will also add a statement to the effect that the five year review may be used to ensure that the restrictions are being adhered to. Finally, a statement will be added that EPA may reconsider the remedy as provided in CERCLA.

14. **Comment: Page A-7; Section 2.3, Likelihood of Future Residential Use, Institutional controls Currently In Place:**

Add the following language. However, the deed restrictions do have a termination clause for future residential use; these restrictions will need to be revised. Furthermore, the deed restrictions may need to be further revised after the implications of the new risk assessment are considered.

Response:

Language stating that the already recorded deed restrictions include termination clauses will be added to the Land Use document. However, that termination language explicitly requires written notification by U.S. EPA and/or IDEM that "an environmental clean up has been completed to its satisfaction rendering the ACS Site suitable for all uses whatsoever or until such time as U.S. EPA and/or IDEM determines in writing that the ACS site poses no unacceptable risk for residential use." Given these requirements for U.S. EPA and/or IDEM written concurrence before deed restriction termination, the Committee does not believe the existing deed restriction termination clauses require modification. The Committee recognizes that additional deed restrictions may need to be imposed once the risk assessment is completed and a final remedy approved.

15. Comment: Page A-7; Section 2.3, Likelihood of Future Residential Use, Institutional Controls Currently In Place:

Describe further the different land owners which own the land which comprise the Site proper. Discuss whether there are institutional controls in place on each of the properties, (i.e., deed restrictions) on use of groundwater, in the area surrounding the Site proper. Discuss whether the area businesses and current residential areas southeast of the site are restricted from using ground water. Provide information on the current groundwater users.

Response:

As U.S. EPA is aware, there are three entities which own portions of the ACS Site proper. The first of these is American Chemical Service, Ind., an Indiana corporation with a principal place of business at 420 South Colfax Avenue, Griffith, Indiana. That corporation owns the ACS facility itself (with the exception of a four acre action leased from CSX Transportation) and the Off-Site Containment Area. Total acreage within the ACS Site, owned by American Chemical Service, Inc. is about 30 acres.

As noted, CSX Transportation owns a four acre parcel which it leases to American Chemical Service. That land is located at the northern end of the ACS facility and includes the On-Site Containment Area.

The final property owner is Dr. Zarija Djurovic. Dr. Djurovic owns the former Kapica/Pazmey property at the southern end of the facility. His property consists of approximately two acres.

Each of the properties within the ACS Site have deed restrictions on the use of ground water for domestic use already recorded in Lake County. In addition, each property has recorded deed restrictions preventing residential development and interference with remedial measures.

16. Comment: Page A-7, Section 2.3; Likelihood of Future Residential Use, Institutional controls Currently In Place:

In the discussion of institutional controls currently in place, there is no discussion of the enforceability of such restrictions under Indiana law. In addition, this section does not address how to retain reliability or enforceability of these restrictions should the property transfer several times. Research in other similar situations under other states' laws suggests that these restrictions are most enforceable against later transferees if a restrictive easement is granted to U.S. EPA, the state or a local government agency. Provide an analysis - of the enforceability of such deed restrictions and the conclusions should be presented to U.S. EPA. Furthermore, the report does not unequivocally state that these restrictions cover each of the parcels of land that comprise the Site. This should be clearly rated. With respect to the actual restrictions, the restrictions should state that a UAO requiring implementation of the remedy exists. Also, the restrictions should prohibit certain land uses that may be of concern, such as schools or day cares. Once we understand what remedy will be in place at the Site, additional restrictions would be needed to prevent interference with the remedy.

Response:

Again, the deed restrictions have been imposed on all parcels within the ACS Site as stated above in response to Comment 15.

In terms of enforceability of the deed restrictions under Indiana law, the restrictions are clearly enforceable under that State's well established property law. In *Moseley v. Bishop,* 470 N.E.2d 773 (Ind. App. 1984), the court found that covenants intended to run with the land, which concern the use or enjoyment of the land and for which there is notice to subsequent transferees, were enforceable. All of these pre-conditions for enforceability exist with respect to the recorded deed restrictions in the ACS matter. The recorded covenants all state that they run with the land and apply to successor transferees. All of the recorded deed restrictions relate to the use or enjoyment of the ACS properties; each restricting that use in some way. Finally, in each case there is notice to subsequent transferees through the recording of each restriction in each property's chain of title.

The covenants are viewed as contractual obligations of the original parties as well. *Cunningham v. Hiles*, 182 Ind. App. 511, 395 N.E. 2d 851 (1973). Therefore, the Committee is in a direct position to enforce the deed restrictions should the need arise. *See also Noblesville Redevelopment Commission v. Noblesville Associates, et al.*, 646 N.E. 2d 364 (Ind. App. 1995), *Adult Group Properties v. Imler*, 505 N.E. 2d 459 (Ind. App. 1987), *Conduit v. Ross*, 102 Ind. 166, 26 N.E. 198 (1885) and *Wiley v. Baumgardner* 97 Ind. 66 (1884).

Based on Indiana law, the deed restrictions recorded with respect to the ACS property are clearly enforceable against both current and future property owners.

17. **Comment: Page A-8; Section 2.3, Likelihood of Future Residential Use, Location of Wellhead Protection Areas/Potential Vulnerability of Ground Water, Second Paragraph:**

Rewrite the first sentence to indicate that the barrier wall and groundwater collection trench and treatment system have been installed to address only a portion of the groundwater contamination.

Response:

The text will be modified to indicate that the barrier wall and ground water collection trench and treatment system have been installed to prevent further migration of constituents from the site in the shallow aquifer.

18. **Comment: Page A-8; Section 2.3, Likelihood of Future Residential Use, Location of Wellhead Protection Areas/Potential Vulnerability of Ground Water, Second Paragraph:**

Add the following to the end of the paragraph. However, many local residents rely on ground water.

Response:

The text will be modified consistent with the EPA comment. The nature of the current use of ground water by local residents will also be included.

19. **Comment: Page A-8; Section 2.3, Likelihood of Future Residential Use, Institutional controls Currently in Place:**

The deed restrictions actually state that the ground water shall not be used for residential purposes. This would presumably include drinking water and other activities such as lawn watering. However, in the past, although the deed restrictions prohibited the use of groundwater for residential purposes, groundwater on-site had been used as drinking water for the plant. This emphasizes the need for clarifying the issue of "enforceability" of the deed restrictions as is mentioned above.

Response:

As explained in response to Comment 16 above, the existing deed restrictions are enforceable. As to ground water use, the ACS facility had only deeper wells and all of these wells have now been properly abandoned using U.S. EPA approved procedures. The facility used these wells primarily for production water purposes. In recent years, bottled water has been used for drinking water for plant personnel. Since the imposition of the deed restrictions, the wells at the facility have not been used for drinking water purposes according to ACS. Prior to the use of bottled water, the facility used a reverse osmosis system to treat its drinking water from on-site wells. At this time, the facility has connected to the municipal water supply so no ground water from beneath the facility is in use. With the abandonment of all wells and the municipal water connection, as well as the deed restrictions, it is highly unlikely ground water would be used in the future.

20. **Comment: Page A-8; Section 2.4, Other Information Potentially Related to Land Use, Federal/State Land Use Designation:**

This section seems to be restricted to land currently owned by either State or Federal Government Agencies. It should also include specific land uses which are regulated by State or Federal Laws. Specifically, several wetlands, most of which will be deemed to have jurisdictional status in addition to biological definition, will have very narrowly defined Federal land use designation and must be considered here.

Response:

A discussion of wetlands will also be included in Section 2.4, at EPA's request.

21. **Comment: Page A-9, Section 2.4, Other Information Potentially Related to Land Use; Natural Resource Information:**

Information contained in this section is incorrect, both in the misrepresentation of CERCLA and in content of information readily available for the site and surrounding area. Specifically, Section 101 of CERCLA, defines natural resources as ..." (16) "natural resources" means land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States" .... ", any State or local government, or any foreign government;". The statement that . . . "No specific natural resources, as defined in CERCLA Section 101, are located at the site." . . . illustrates a complete lack of understanding of not only the Law (specifically CERCLA, but not limited to CERCLA), but of the definition or value of natural resources. The implied definition of natural resources used is the value of the area for industrial development (see last sentence of this subsection).

Response:

The Committee is familiar with the CERCLA Section 101(16) definition of "natural resources." The intent of the statement in the Land Use document was to indicate that no Federal, State, Indian Tribe, or local government owned or controlled property exists adjacent to or on the ACS Site. The Committee understands that U.S. EPA or the Trustees may believe that there are "resources" they view as "held in trust" or "which are otherwise controlled" under some statutory jurisdiction. It is useful to note the decision in *State of Ohio v. U.S. Department of the Interior*, 880 F.2d.432 (D.C. 1989) which sets forth a description of natural resources for CERCLA purposes. That description notes that damage to private property absent any governmental involvement, management or control is not covered by the natural resource damage provisions of the statute. The Department of Interior regulations on assessing natural resource damages also add some clarity to the scope of the CERCLA definitions. We will clarify our statement in the Land Use Document.

22. **Comment: Page A-9, Section 2.4; Other Information Potentially Related to Land Use, Location of Wellhead Protection Areas/Potential Vulnerability of Ground Water:**

Discuss that there are ground waters users in the vicinity of the Site. Discuss how the current contamination of ground water, and through its discharge, surface water, shall be considered. Ground water is being directly impacted by this site and the risk assessment correctly looks at the effect of that impact on humans use currently or in the future.

Response:

The text will be modified consistent with the EPA comment.

23. **Comment: Page A-9; Section 2.4, Other Information Potentially Related to Land Use, Location of On-Site or Nearby Wetlands:**

Wetlands are also located to the North of the site (just north of the Grand Trunk Railroad), to the east between the Grand Trunk Railroad and the Chesapeake and Ohio Railroad, to the southwest between the Chesapeake and Ohio Railroad and the Chicago and Erie Railroad. Other small to very large wetland complexes are also located within ½ to 1 mile of the site to the northwest, the southwest and to the east. This information must be added to the discussion.

Response:

The text will be modified consistent with the EPA comment.

24. **Comment: Page A-9, Section 2.4, Other Information Potentially Related to Land Use; Proximity of Site to Critical Habitats of Endangered or Threatened Species:**

This section indicates a very limited review of readily available records regarding endangered or threaten species and habitats at or near the site. A review of the Natural History Database (please contact IDNR Division of Nature Preserves) indicates the following records:

Section 6, T35N, R8W - Forest - Floodplain Wet-Mesic
(State Significant areas) - Forest - Upland Dry
- Wetland - Swamp Shrub

Numerous plant species on State Watch, Rare, Threatened or Endangered have been recorded to the east (Oak Ridge Prairie area) in last 10 years.

Section 2, T35N, R9W - Prairie - Sand Wet
(State Significant areas) - Savanna - Sand Dry-Mesic

Section 3, T35N, R9W - Karner Blue Butterfly
(State/Federal Endangered)

There are approximately 100 records of significant, endangered, threatened, rare or of special concern fauna or flora in the database in areas within ½ to 1 mile from the ACS site. Few are located directly on the site but are in surrounding areas. Mobile species and those in areas with pathways for contaminant release could be impacted by this site.

Response:

The information provided in the EPA comment will be incorporated into Section 2.4, at EPA's request.

25. **Comment: Page A-9, Section 2.4, Other Information Potentially Related to Land Use, Location of Wellhead Protection Areas/Potential Vulnerability of Ground Water:**

Add the following to the last sentence: However, nearby residents rely on groundwater for residential purposes such as drinking, bathing and landscaping. Also, include a discussion of impacts on private wells in the area and proximity to such private wells.

Response:

The text will be modified consistent with the EPA comment. The nature of residential use of upper and lower aquifer ground water will also be included.

26. **Comment: Page A-9; Section 2.4, Other Information Potentially Related to Land Use, Geologic and Hydrologic information:**

Add the following as the second sentence. This understanding has been updated during recent site characterization activities such as is found in the upper aquifer technical memoranda and the lower aquifer technical memorandum.

Response:

The text will be modified consistent with the EPA comment.

27. **Comment: Page A-11, Section 3.0, Conclusion, fourth bullet:**

Please clarify that while all land immediately adjacent to the Site is zoned industrial, residential uses can be found adjacent to the site . The point to stress is that it is unlikely the ACS property, the offsite containment area and the Kapica Pazmey area are unlikely to be used for anything other than commercial/industrial uses. Hence, it is reasonable to assume the site will be used for commercial/industrial purposes.

Response:

The text will be modified consistent with the EPA comment.

28. **Comment: Page A-11, Section 3.0, Conclusion, fourth bullet:**

Based on the history of the site, and the immediate surrounding area, a reasonable assumption is that the land would not be used for residential purposes and that anything other than industrial/commercial would be unlikely.

Response:

The text will be modified consistent with the EPA comment.

29. **Comment: Page A-11, Section 3.0, Conclusion, fifth bullet, last sentence:**

In the second sentence, remove "more than" and replace with "should be".

Response:

The text will be modified consistent with the EPA comment.

30. **Comment: Page A-11, Section 3.0, Conclusion, last paragraph:**

Add the following: Based upon the history of the Site, present zoning and master plan, and deed restrictions, a reasonable assumption that the land would be used as anything other than industrial/commercial would be unlikely. If the landowner/PRPs would like to redevelop the site with a higher land use later, EPA would expect them to pay for the necessary additional cleanup. Furthermore, this decision does not affect the future of the surrounding area to continue to be used for residential purposes.

Response:

The text will be modified consistent with the EPA comment.

31. **Comment: Page A-12, References:**

Add Communication with Bill Greco, Griffith Building Commissioner.

Response:

The text will be modified consistent with the EPA comment.

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